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Technical Reports

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Apparel

PRINCIPLES OF COLD WEATHER CLOTHING AND EQUIPMENT. U. S. War Dept. Feb 1946. 18p drawings, map Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 58421s
1. Clothing, Cold weather 2. WD TM 10-275.

Chemicals and Allied Products

Agricultural Chemicals

REPORT OF THE PEST INFESTATION RESEARCH BOARD, WITH THE REPORT OF THE DIRECTOR OF PEST INFESTATION RESEARCH FOR THE YEAR 1950. Gt. Brit. Dept. of Scientific and Industrial Research. Pest Infestation Research Board. 1952. 47p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107380
1. Pest control - Gt. Brit. 2. Insecticides - Evaluation - Gt. Brit. 3. Fumigants - Gt. Brit. 4. DDT - Insecticides - Gt. Brit.
Sir John Simonsen, Chairman. Contents. Appendix I: Pest infestation research publications. - Appendix II: Staff of the Pest Infestation Laboratory, 1950.
S. O. code no. 47-153-0-50.

Paints, Varnishes and Lacquers

BINDERY GLUES, by Morris S. Kantrowitz, Ernest W. Spencer, George G. Groome, and Frederick R. Blaylock. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 16p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107618
1. Bookbinding - Adhesives 2. Glue - Specifications 3. Glue, Animal - Manufacture.
GPO-PIA joint research bulletin, bindery series no. 3.

BOOKBINDING PASTES, by Morris S. Kantrowitz and Frederick R. Blaylock. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 4p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.10. PB 107617
1. Adhesives - Paper to paper 2. Bookbinding - Adhesives.
GPO-PIA joint research bulletin, bindery series no. 2.

Miscellaneous Chemicals

ALLYL STARCH ESTERS, by J. H. Schwartz, C. A. Brown, and E. A. Talley. U. S. Eastern Regional Research Laboratory, Philadelphia, Pa. Jun 1952. 10p tables Available from Eastern Research Laboratory, Philadelphia 18, Pa. PB 107528
1. Starch, Allyl ester 2. Films, Starch - Tests 3. AIC 339.

CHEMICAL RESEARCH REPORTS. I. G. Farbenindustrie A. G. 1940-1946. 757f drawings, graphs, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $100.00. PB 105489
1. Acetaldehyde - Production - Germany 2. Acetylene chemistry - Research - Germany 3. Acetic acid - Synthesis - Germany 4. Acrylamides - Production - Germany 5. Acrylic acid - Production - Germany 6. Acrylic acid - Esters - Production - Germany 7. Acrylic acid, Butyl ester - Preparation - Germany 8. Adipic acid - Production - Germany 9. Alcohols - Hydrogenation - Germany 10. Butadiene - Distillation products - Germany 11. Butadiene - Research - Germany 12. 1,4-Butanediol - Distillation residues - Uses - Germany 13. 1,4-Butanediol dichlorocarbonic esters - Production - Germany 14. 3-Butyn-2-ol, 2-Methyl - Germany 15. Carbonyl hydrogen - Germany 16. Cobalt carbonyl hydrogen - Germany 17. Cyclooctatetraene - Preparation - Germany 18. Drying oils, Synthetic - Research - Germany 19. Glycols - Chemical reactions - Germany 20. Hexadiynediol - Preparation - Germany 21. Iron carbonyl hydrogen - Germany 22. Isobutyric acid, Sulfonyldi - Germany 23. Iron carbonyls - Germany 24. Iron carbonyl hydrogen - Germany 25. Lactams, n-Vinyl - Germany 26. Nickel carbonyl - Production - Germany 27. Olefins - Oxidation - Germany 28. Polyamides - Intermediates - Germany 29. Polyvinyl chloride - Fabrication - Germany 30. Propargyl alcohol - Germany 31. Pyrrolidone - Derivatives - Germany 32. Pyrrolidone, Polyvinyl - Germany 33. Resin acids, Synthetic - Research - Germany 34. Textile aids - Production - Germany 35. Textile aids - Raw materials - Germany 36. Micro FIAT CC 255.
Some frames will not reproduce. Contents: No. A. Umsetzungen mit carbonylwasserstoffen (Reactions with carbonyl hydrogen) - No. B. German paper p. 38/29 - 38/42 (illegible). - Incl. 4. Über eine bestimmung des propargylalkohols (Determination of propargylalcohol) Oct 7, 1943. - Incl. 6. Darstellung von hexadiindiol aus propargylalkohl und luft unter druck (Preparation of hexadiindiol from propargylalcohol and pressurized air) Oct 7, 1946. - Incl. 7. Umsetzung von acetylen mit formaldehyd (Reactions of acetylene with formaldehyde) Oct 2, 1946. - Incl. 8. Über die gewinnung von hexadiindiol aus propylalkohol (Preparation of hexadiindiol from propylalcohol) by Dr. Kohler, Oct 7, 1946. - No. 2. Cyklooktotetraen Allgemiein #747 (Cyclooctotetraene). No. 3. B587. Die kontinuierliche darstellung von 1.4 butandiolpdichlorkohlensäure-ester (Continuous production of 1,4-butanediol dichlorocarbonic acid ester) Mar 2, 1944. No. 4. B679: Über die verwertung der 1.4-butandioldestillationsrückstände (Utilization of 1,4-butanediol distribution residues) Nov 30, 1944. - No. 5. Über die partielle hydrierung einiger alkohols mit dreifach bindung (Partial hydrogenation of some alcohols with triple linkage) Apr 28, 1942. No. 6.

Ein neuer weg zu butadien und anderen dienen aus acetylen und aldehyden bezw. ketonen (A new approach to butadiene and dienes from acetylenes and aldehydes or ketones) Jan 12, 1946. No. 7. Cyclooctotetraen nach Reppe (Cyclooctotetraenes according to Reppe) Feb 13, 1942. No. 8. Über das nickelkarbonyl Ni(Co)4 (Nickel carbonyl Ni(Co)4. - No. 11. No. 1582: Über die kontinuierliche herstellung von o-pyrroliden (Continuous production of o-pyrrolidine) Mar 3, 1944. - No. 12. Acetylen allg/versuche (General research on acetylene) 1941. No. 13. Versuche zur darstellung von acrylsäure und acrylsäureester (Research on production of acrylic acid and acrylic ester). - No. 14. Inhaltsverzeichnis (Table of contents) May 11, 1942. - No. 15. B402: Über die katalytische acrylsäurebutylesterdarstellung (Catalytic production of acrylic acid butyl esters) by Dr. Hocht, Dr. Merkel II, and Dr. Heindl. Aug 15, 1941. - No. 16. B670: Über die herstellung von adipinsäure aus tetrahydrofuran und kohlenoxyd (Production of adipic acid from tetrahydrofurane and carbon oxide) May 25, 1944. - No. 17. Synthese der adipinsäure aus tetrahydrofuran, wasser und kohlenoxyd Reppe, 1940-41 (Synthesis of adipic acid from tetrahydrofurane, water and carbon oxide by Reppe, 1940-41) Mar 19, 1942. - No. 18. Zeitschrift für augewandte chemie #25 (volume not given). - No. 19. Folder #149. - No. 20. B677: Über die einwirkung von kohlenoxyd auf olefins (On the effect of carbon oxide on olefins). - No. 21. Bericht über die herstellung von adipinsäure aus tetrahydrofuran und kohlenoxyd (Report on the production of adipic acid from tetrahydrofurane and carbon oxide). - No. 22. Einwirkung von kohlenoxyd auf olefine auch alkohols (Effect of carbon oxides and alcohols). no. 702, by Dr. Kroper, Dr. Bretschneider, Dr. Pistor and Dr. Schlenk. Oct 9, 1940. - No. 23. Betreff: Über eisencarbonylwasserstoff (Subject: Concerning iron carbonyl hydrogen). No. 24. Sitzung der Kunstoff-Kommission an 21 und 22 Nov 1941 in Frankfort (Session of the Synthetic Rubber Commission in Frankfort) Jun 13, 1940. - No. 27. Versuche zur darstellung von acrylamiden aus aminen, kohlenoxyd und acetylen (Research on production of acrylamides from amines, carbon oxide and acetylene). Jun 13, 1940. - No. 28. B245. Versuche zur darstellung von acrylester aus kohlenoxyd, acetylen und alkohol mi einen katalysator (Research on production of acrylesters from carbon oxide, acetylene and alcohol with a catalyser) #96 - No. 29. No. 706. Ergebnisse des Reppe-verfahrens von 24 Jan 1941 (Results of Reppe-process, 24 Jan 1941). - No. 32. B216. Methylbutinol (Methyl butynol) by Dr. Pesta and Dr. Ebel. Apr 20, 1940. - No. 33. Acetaldehyd aus acetylen über vinylmethyläther (Acetaldehyde from acetylene on vinylmethyl ester) by Dr. Reppe. - No. 35. Über die partielle hydrierung einiger alkohols mit dreifachbindung (Partial hydrogenation of some alcohols with three-fold bond) Jun 5, 1942. - No. 36. Folder A: Grosstechnische produkts #39 (Wholesale products). No. 38. Über die gewinnung von nickelcarbonyl aus ammoniakalischer nickelschloridlösung (Production of nickel carbonyl from solution of nickel chloride) by Dr. Schuster and Dr. Kohler. 12 Apr 1941. - No. 39. Umsetzung der durch hydrierung von alkendiolen zuganglichen glykols (Reaction of glycols amenable to hydrogenation by alkene olefins). - No. 40. Über den derseitigen stand des neuen butadienverfahrens (The present state of the new butadine research) #73. 6 Sept 1940. - No. 41. Wissenschaftliche Zetko: Über sulfondibuttersäure und ihre ester (Sulfodiisobutyric acid and its ester) by Dr. Krizikalla and Dr. Hochadel. 22 Apr 1941. - No. 43. Über den technischen-butadienkontakt (Technical butadiene contact) 25 Apr 1942. - No. 44. B437. Versuche zur kontinuierlichen darstellung von acrylamiden aus aminen, kohlenoxyd und acetylen (Experiments on continuous production of acrylamides from amines, carbon oxide and acetylene) by Dr. Knecht and Dr. Gassenmeier. #145. Dec 15, 1941. - No. 45. B547. Über die katalytische acrylsäure butylester-darstellung im rieselofenverfahren mit polyglykolen als flüssigen kontaktträger und NiBr2 als wirksamer kontaktsubstans (Catalytic production of acrylic acid butyl ester in cooling oven experiments with polyglycols as flowing contact carrier and NiBr2 as effective contact substance) 15 Apr 1943. - No. 46. Photostat copy of figures 5 and 6. - No. 48. Letters written to Dr. Reppe. - No. 49. Versuche zur darstellung von acrylsäure und acrylsäureester III (Experiments on production of acrylic acid and acrylic acid ester III) #64. 6 Jul 1940. - No. 50. Folder of German papers vol. 26. - No. 51. Versuche zur darstellung von acrylsäure und acrylsäureester III (Experiments on production of acrylic acid and acrylic acid ester III) #99. - No. 52. B675. Über die verwertung der destillationsrückstände des butadiene nach der Reppe-synthese (Utilization of distillation residues of butadiene according to the Reppe synthesis) #5. 11 Sep 1944. - No. 53. B679. Über die verwertung des 1.4-butandiol-destillationsrückstände der B-III anlage (Utilization of 1,4-butanediol distillation residues of the B-III installation) by Krzikalla and Flickinger. - No. 54. Chemie-arbeit in werk und labor (Chemical employment in plant and laboratory). - No. 55. Wissenschaftliche arbeiten der I. G. auf dem gebiet der synthetische harzsäuren und trocknenden ole (Scientific research of I. G. Farbenindustrie on synthetic resin acids and drying oils) 16 Feb 1940. - No. 56. B689. Potentometrische titration von kobaltscarbonylwasserstoff und eisenkarbonylwasserstoff zwecks nachweis ihres säurecharakters (Potentiometric titration of cobalt carbonyl hydrogen and iron carbonyl hydrogen for the purpose of proving its acid characteristics) 19 Aug 1944. - No. 57. Über die gewinnung von nickelcarbonyl aus ammoniakalischer nickelchloridlösung (Production of nickel carbonyl from ammonium nickel chloride solution). - No. 58. B 342. Über die reinen eisencarbonyle (On the pure iron carbonyls) by Karl Merkel. 3 Feb 1941. - No. 59. Manufacture and fabrication of polyvinyl chloride at I. G. Farbenindustrie, Bitterfeld. - No. 64. B568. Polyvinylpyrroliden (Periston, Kollidone) Polyvinyl pyrrolidines (Periston, Kollidone) by Dr. Fikentscher and Dr. Herrls #65. 10 Nov 1943. - No. 65. Über polyamid-zwischenprodukte auf acetylenbasis (Polyamide intermediate products of an acetylene base). No. 66. Wissenschaftliche Zetko: Über einige derivate des pyrrolidone (Some derivatives of pyrrolidone) by Dr. Schuster. - No. 67. N-vinylberbindungen von laktamen (N-vinyl compounds of lactams) by Dr. Schuster and Dr. Sauerbier. 17 Apr 1939. - No. 68. Synthese der essigsäure durch einwirkung von kohlenoxyd auf methanol (Synthesis of acetic acid by the action of carbon oxide on methanol) summer 1941-Jun 1942, #70, by Dr. Kroper, Dr. Pistor, and Dr. Kutspow. - No. 69. Spaltung von vinylmethyläther mit hilfe eines säurehaltiges festungsordneten kontaktes (Fission of vinyl methyl ether by the aid of an acid-containing, strongly fortified contact) by Dr. Pesta. 11 May 1942. - No. 70.

B281. Versuche zur katalytischen acrylestersynthese (Experiments on catalytic synthesis of acrylic esters) by Dr. Weschky and Dr. K. Wolf. 20 Jun 1940. - No. 72. Acetylen allg/versuche über die pH-einstellung und die damit in zusammenhang stehenden abgiessengen und acetylenausbauten in der butendiolsynthese (Acetylene research on pH adjustment and the cast off products in conjunction with it and the acetylene equipment in the butenediol synthesis). - No. 73. I. G. F. physikalischer betrieb Lu 241 (Work in physics at I. G. Farbenindustrie, Ludwigshafen) 24 Sep 1942. - No. 74. Über die herstellung von waschrohstoffen und textilhilfmitteln aus ungesättigten kohlewasserstoffen durch anlagerung von 00 und alkoholen bzw. wasser (Production of washed raw materials and textile aids from unsaturated hydrocarbons by addition of 00 and alcohols or water) by Dr. Kröper, Dr. Bretschneider, Dr. Pistor, Dr. Schlenk. 14 Dec 1940. - No. 75. B302. Eine neue synthese von acrylsäure und deren derivaten (A new synthesis of acrylic acid and its derivatives) by Dr. Reppe. 14 Dec 1940. - No. 76. Versuch zur katalytischen acrylestersyntheses (II) (Experiments on catalytic synthesis of acrylic esters) by Dr. Weschky. 1 Jul 1941. - No. 78. Acetylen Reichsluftfahrtministerium. - No. 79. Das acetylen als baustein einer neuen technischer chemie (Acetylene as cornerstone of a new technical chemistry). - No. 80. Fortschritte der acetylenchemie in Werk Ludwigshafen-am-Rhein (Progress of acetylene chemistry in the Ludwigshafen plant of I. G. Farbenindustrie) 26 Aug 1940. - No. 81. Die abtrennung und aufarbeitung der von den rohbutandiollösungen abgetrennten mono-ole (Separation and working up of mono-oils separated by the dissolving of crude butanediol) by A. Hrubesch. - No. 82. Reinheitsbestimmungen an butadien (Determination of the purity of butadiene) by Dr. Wenning. 12 Dec 1941. - No. 83. Versuche zur direkten herstellung von butadien aus der etwa 30 bis 35 igen wasserigen lösung von 1.4 butylenglykol (Rohlösung) (Experiments on direct production of butadiene by dissolving 1,4-butylene glycol in water 30 or 35 times) by Dr. Frieschmann and Dr. Schultze. 4 May 1939. - No. 84. Technische einzelheiten B-III (Technical details of the B-III installation). - No. 85. B786. Versuche über den acetylenzerfall (Research on acetylene decomposition) by Dr. Weissweiler. 5 Feb 1940. - No. 86. Berichte über verhandlungen bei der Chemisch-Technische Reichsanstalt und beim Reichswirtschaftsministerium über die genehmigung der Reppe-anlage in Schkopau (Report of proceedings in the National Chemical-Technical Institute and the Ministry of Economics on the acceptibility of the Reppe installation in Schkopau). - No. 87. Acetylen-allg. (Acetylene. General discussion). - No. 88. Folder 1935 p b. - No. 89. Folder. Inhaltsverzeichnis (Contents). - No. 90. Folder 3F. - No. 91. Folder. Askania-Werke A. G., Berlin. - No. 92. Folder (Papers). - No. 93. Charts. - No. 95. Zu dem bericht über die reinen eisencarbonyle des Herrn Dr. Karl Markel (Addition to report of Karl Merkel on pure iron carbonyls) 3 Feb 1941. - No. 96. Envelope with enclosure addressed to Dr. Reppe. - No. 101. Folder Prof. Freiburg. - No. 103. Folder with chapter 3 of Theory of the structure and reactions of aromatic compounds. - No. 104. Folder. Script and chart. - No. 105. Bericht über die besprechung am 10 Dec 1940 (Report on the discussion of Dec 10, 1940). - No. 106. Acetylen allg/versuch. (General research on acetylene) No. 744. - No. 107. Bericht des Herrn Dr. Niemann (Report by Dr. Niemann). - No. 108. Eine neue chemie des acetyllene und des kohlenoxyde (New chemistry of acetylene and carbon oxide), by Dr. Reppe. - No. 109. Vinylierungen (Vinylation).

COMPARATIVE STUDIES ON GALLIUM CHEMISTRY. FINAL REPORT by Therald Moeller, Alvin J. Cohen, Glendall L. King, Fred L. Pundsack. Illinois. University, Urbana, Ill. Sep 1950. 70p graphs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75.
PB 107704

A brief outline is presented of previous investigations relating to (1) evaluation of absorption spectra, (2) determination of microquantities of Ga and Th by spectrochemical methods, (3) photochemical-decomposition studies, and (4) preparation of Ga-containing spinels. Contract N6ori-71, Chemistry task no. XVII.

CORRESPONDENCE AND LABORATORY REPORTS OF WORK ON ACETYLENE AND CHEMICAL RESEARCH. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1939-1946. 1200f graphs (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $156.25. PB 105487

1. Acetylene chemistry - Research - Germany 2. Chemical research - Germany 3. Acetylene - Decomposition - Germany 4. Alcohols, Acetylenic - Preparation - Germany 5. Adipic acid - Preparation - Germany 6. Adipic acid - Esters - Preparation - Germany 7. Butadiene - Production - Germany 8. Butene-1,4-diol - Preparation - Germany 9. 3-Butyne-2-ol - Preparation - Germany 10. 3-Hexyne-2,5-diol - Preparation - Germany 11. Furan, Tetrahydro - Preparation - Germany 12. 1,6-Hexadiyndiol - Preparation - Germany 13. Iron carbonyls - Preparation - Germany 14. Nickel carbonyl - Preparation - Germany 15. Polyamides - Intermediates - Preparation - Germany 16. Polyvinyl chloride - Preparation - Germany 17. Micro FIAT CC-254.

Contents: Bericht über die besprechung am 10 Dec 1940 im Ludwigshafen betr. acetylenzerfall (Report of the conference of 10 Dec 1940 in Ludwigshafen on acetylene decomposition). - Zerfall zur acetylene (Decomposition of acetylene). - Acetylen. Umwandungsprodukte aus butin-1-ol-3. Umwandungsprodukte aus hexin-3-diol-2.5 (Acetylene. Conversion product from 3 butyn-2-ol and from 3-hexyne-2,3-diol) by J. Opel. - Acetylen. Werke Hüls, Chemische, Marl (Recklinghausen) (Acetylene Hüls Works, Chemistry, Marl (Recklinghausen). - Verfahren zur herstellung von alkoholen der acetylenreibe (Efforts to prepare alcohols of the acetylene series). - Besprechung zwischen Dr. Reppe, Dr. Hopff, Dr. Jordan am 27 Jan 1938 (Conversation between Dr. Reppe, Dr. Hopff and Dr. Jordan on Jan 27, 1938). - Bericht über die herstellung von adipinsäure aus tetrahydrofuran und kohlenoxyd, pt. 3 (Report on preparation of adipinic acid from tetrahydrofuran and carbon monoxide). - Über polyamid-zwischenprodukte auf acetylenbasis (On polyamide intermediate products with acetylene basis). - Versuche zur darstellung von acrylsäure und acrylsäureester

(Research on production of acrylic acid and acrylic acid ester), by Dr. Schuster and Dr. Keller. - Das acetylen als baustein einer neuen technischen chemie. Vortrag, Dr. Reppe 25. sitzung der Kunststoff-Kommission in Frankfurt 21 and 22 Nov 1941 (Acetylene as cornerstone of a new technical chemistry. Address by Dr. Reppe at the 25th meeting of the Kunststoff-Kommission in Frankfort 21-22 Nov 1941). - Eisencarbonylwasserstoff. Bericht Dr. Reindl (Iron carbonyl hydrogen. Report by Dr. Reindl). - Wissenschaftliche Zetko, austausch 1941 (Zetko meeting 1941). - Über die gewinnung von nickelcarbonyl aus ammonialkalischer nickelchloridlösung, von Dr. Curt Schuster and Dr. Rudolph Keller (Production of nickel carbonyl from ammonium alkaline nickel chloride solution). - Vinylierungen (Vinylation). - Tetrahydrofurane (Tetrahydrofuran). - Manufacture and fabrication of polyvinyl chloride, I. G. Farben, Bitterfeld, reported by R. H. Boundy and R. L. Hasche (Also PB 514). - Darstellung von 1,6 hexadiindiol aus propargylalkohol und luft unter druck (Production of 1,6 hexadiindiol from propargyl, alcohol and pressurized air), by Dr. v. Kutepow. - Eine neue chemie des acetylene und des kohlenoxyds (A new chemistry of acetylenes and carbon monoxides) by Walter Reppe (Also PB 18953s2). - Betr. acetylen (Concerning acetylenes). - Butadien aus butylenglykoldiacetaten (Butadiene from butylene glycol diacetates) by Dr. Niemann. - Technische darstellung von 1,4-Butindio (Technical production of butene-1, 4-diol) by Dr. Steinhofer and Dr. Spänig. 2 May 1939.

DETERMINATION OF THORIUM BY A VOLUMETRIC IODATE PROCEDURE, by Therald Moeller and Nancy Downs Fritz. Illinois. University, Urbana, Ill. Jan 1948. 24p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107696

1. Thorium - Determination 2. Monazite - Thorium determination 3. Meyer-Speter procedure (Thorium determination).

Contract N6ori 71, Chemistry task no. VII.

DEVELOPMENT OF MILDEWPROOFING COMPOUNDS. WYANDOTTE CHEMICALS CORPORATION, WYANDOTE, MICH. FINAL AND SUMMARY REPORT. Dec 1945. 83p tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 107607

More than four hundred preparations have evaluated as mildewproofing and preservative agents for cotton duck when applied at a level of 2 per cent on the dry fabric weight. In screening tests, 377 mixed pure culture mildewproofing tests have been conducted upon nearly an equal number of chemical products with the finding that 35 per cent (approximately) withstood fourteen-day exposure to the depreciating organisms without greater than 10 per cent tensile strength loss. An additional 5 per cent lost 10-20 per cent, and the remaining compounds showing greater loss were rated poor and beyond further consideration. A selected list of the better materials surviving the pure culture tests has been subjected to soil burial tests along with other materials more recently available. Of 173 materials entered under fourteen-day soil burial tests, 48 have shown protective action to the extent of not greater than 10 per cent loss in tensile strength. Of these, 16 compounds are copper derivatives, 23 are resins or resin derivatives from the condensation of chlorophenols with formaldehyde and salicylic acid, and the rest are products of diverse nature. The resins remain yet to be fully evaluated since considerable lack of duplication was observed in both the preparations and in mildewproofing effectiveness. Contract W-18-035-CWS-933. Contents: Sec. I: Synthesis of organic compounds for evaluation as mildewproofing agents and preservatives for cotton cloth, by Organic Division. - Sec. II: Microbiological testing of organic compounds as mildewproofing agents, by Microbiological Division.

Electrical Machinery

Communication Equipment

HANDBOOK OF MAINTENANCE INSTRUCTIONS FOR AIRCRAFT RADIO RECEIVING EQUIPMENT: AN/ARR-2, AN/ARR-2X, AN/ARR-2A, AN/ARR-2AX, TEST OSCILLATORS TS-24A/ARR-2. U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Nov 1948. 222p photos (part fold), drawings, (part fold), graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $8.00, Photostat $28.75. PB 107555r

1. Radio receivers - Maintenance and repair 2. Oscillators, Test - Maintenance and repair 3. AN/ARR-2 (Radio receivers) 4. AN/ARR-2X (Radio receivers) 5. AN/ARR-2A (Radio receivers) 6. AN/ARR-2AX (Radio receivers) 7. TS-24A/ARR-2 (Test oscillators) 8. AN 16-30ARR 2-2, revised.

This publication is a reprint of CO-AN 08-25E-1 dated Aug 1944.

HANDBOOK OF MAINTENANCE INSTRUCTIONS FOR AIRCRAFT RADIO RECEIVING EQUIPMENT: AN/ARR-2, AN/ARR-2A, AN/ARR-2X, AN/ARR-2AX, TEST OSCILLATORS TS-24A/ARR-2. U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Apr 1951. 15p photos, fold drawing, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107555r2

Partial revision of PB 107555.

HANDBOOK OF MAINTENANCE INSTRUCTIONS FOR AIRCRAFT RADIO RECEIVING EQUIPMENT: AN/ARR-2,AN/ARR-2A, AN/ARR-2X, AN/ARR-2AX, TEST OSCILLATORS TS-24A/ARR-2. U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Oct 1951. 5p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107555r3

Partial revision of PB 107555.

RADIO SETS AN/PRC-8, AN/PRC-9 AND AN/PRC-10, FIELD MAINTENANCE. U. S. Army and U. S.

Air Force . 1951. 93p photos, drawings, diagrs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50.
PB 107558

1. U. S. Air Force 2. AN/PRC-8 (Radio set) 3. AN/PRC-9 (Radio set) 4. AN/PRC-10 (Radio set) 5. Radio - Maintenance and repair 6. WD TM 11-4065 7. AAF TO 16-30 PRC 8-5.

Electronics

DEVELOPMENT OF MINIATURIZED DUAL CONTROL RF PENTODE. 22D INTERIM ENGINEERING REPORT FOR DEC 1, 1951 TO FEB 1, 1952 UNDER CONTRACT NO. W33-038-AC-21356, by P. Koskos. Sylvania Electric Products, Inc., Kew Gardens, N.Y. Aug 1952. 9p diagrs Available from Library of Congress, Publication Broad Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 107608

1. Vacuum tubes, Pentode - Miniaturization.
For 23d-25th reports see PB 107609-107611.

DEVELOPMENT OF MINIATURIZED DUAL CONTROL RF PENTODE. 23D INTERIM ENGINEERING REPORT FOR FEB 1, 1952 TO APR 1, 1952 UNDER CONTRACT NO. W33-038-AC-21356, by P. Koskos. Sylvania Electric Products, Inc., Kew Gardens, N.Y. Aug 1952. 7p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107609

1. Vacuum tubes, pentode - Miniaturization.
For 22d, 24th-25th reports see PB 107608, 107610-107611.

DEVELOPMENT OF MINIATURIZED DUAL CONTROL RF PENTODE. 24TH INTERIM ENGINEERING REPORT FOR APR 1, 1952 TO JUN 1, 1952 UNDER CONTRACT NO. W33-038-AC-21356, by R. White. Sylvania Electric Products, Inc., Kew Gardens, N. Y. Aug 1952. 6p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 107610

1. Vacuum tubes, Pentode - Miniaturization.
For 22d-23d, 25th reports see PB 107608-107609, 107611.

DEVELOPMENT OF MINIATURIZED DUAL CONTROL RF PENTODE. 25TH INTERIM ENGINEERING REPORT FOR JUNE 1, 1952 TO AUG 1, 1952 UNDER CONTRACT NO. W33-038-AC-21356, by R. White. Sylvania Electric Products, Inc., Kew Gardens, N. Y. Sep 1952. 6p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 107611

1. Vacuum tubes, Pentode - Miniaturization.
For 22d-24th reports see PB 107608-107610.

DEVELOPMENT OF SUBMINIATURE HIGH TEMPERATURE CAPACITORS. BALCO RESEARCH LABORATORIES, NEWARK, N. J. SECOND QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING 13 JUNE 1951, UNDER CONTRACT NO. AF33(038)-17190. Jun 1951. 69p drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75.
PB 107679

Work carried on during this period was concerned chiefly with testing of materials, and included the measurement of Q and C for capacitors at both room and elevated temperatures. An evaluation has also been made of several of the techniques used in capacitor fabrication. From this study to date, several ceramic capacitors and one plastic unit (Teflon) have proved themselves capable of withstanding operation under load at elevated temperatures. One ceramic unit was successfully operated at 29 v/mil (290 v d-c) for 1000 hr at 165°C. The Teflon unit was operated for 1000 hr at 290 v/mil under the same ambient conditions. Equipment has been assembled for investigation of the insulin resistance of capacitors at elevated temperatures and measurements have been made.

DIRECTIVE EFFICIENCY OF ANTENNAS, by Daniel Levine. U. S. Air Force. Wright Air Development Center. Weapons Components Division. Aircraft Radiation Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1951. 15p drawing, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 107677

The directive efficiency of antennas is discussed. The effectiveness of an antenna system in many applications depends not only upon the ohmic losses within the radiating structure, but also upon the fraction of the radiated power which is concentrated in a designated region of space. Therefore, in order to compare antenna systems a directive efficiency may be defined so that the over-all antenna is equal to the product of the radiation efficiency and the directive efficiency, all efficiencies being expressed as fractions. A general equation for the directive efficiency is derived and then applied to two examples. AAF TR 6505.

INTERIM ENGINEERING REPORT ON CONTRACT W33-038-AC-19288 FOR AUG 1952, TO DEVELOP AND PRODUCE MODELS OF BEAM POWER AMPLIFIER (100), PENTODE AUDIO AMPLIFIER (225) AND RF PENTODE AMPLIFIER (199), by David Rufus. Sylvania Electric Products, Inc., Kew Gardens, N. Y. Sep 1952. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 107721

1. Amplifiers, Beam power - Models 2. Amplifiers, Radio frequency - Models 3. Amplifiers, Audio frequency - Models.
Report no. YF52 B1/1167-28.

MAGNESIUM WAVEGUIDES, by Eric W. Wolf. U. S. Air Force. Wright Air Development Center. Weapons Components Division. Aircraft Radiation Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1950. 16p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 107675

Magnesium wave guides can be produced in substantially all the sizes and shapes in which brass and aluminum guides can be made. Their use affords a potential weight reduction of about 80% and 45% over brass and aluminum guides, respectively. Their attenuation is about 20% higher than that of brass guides, and this figure can be improved by silver-plating their inside surface. AAF TR 6504.

PHYSICAL PROPERTIES OF OPTICAL CRYSTALS WITH SPECIAL REFERENCE TO INFRARED, by Alexander Smakula. U. S. Army. Corps of Engineers. Engineer Research and Development Laboratories, Fort Belvoir, Va. Oct 1952. 286p diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $4.00. PB 111053

1. Crystals, Optical - Physical properties 2. Crystals, Optical - Physical properties - Bibliography 3. Infrared optics 4. Infrared research - Bibliography.

"References": p. 133-249.

RADAR RECEIVING SET AN/SPN-7. U. S. Army. Oct 1949. 130p photos, drawings, diagrs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 107564

1. AN/SPN-7 (Radar set) 2. Radar - Receivers 3. WD TM 11-1302.

RADAR RECEIVING SET AN/SPN-7. FIELD AND DEPOT MAINTENANCE. U. S. Army. Mar 1950. 234p photos, drawings, diagrs (part fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $8.25, Photostat $30.00. PB 107565

1. AN/SPN-7 (Radar set) 2. Radar - Receivers 3. WD TM 11-1502.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. POLAROID CORP. RESEARCH DEPT., CAMBRIDGE, MASS. TRIMONTHLY PROGRESS REPORT NO. 8, PERIOD MAR 1-MAY 31, 1950, UNDER CONTRACT W36-039-SC-38105, by H. T. Wolosinski and S. G. Cohen. Jun 1950. 42p graph, tables (1 fold) Available from Library of Congress Publication Board, Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107573

1. Styrene, α-Chloro-β,β-difluoro 2. Styrene, α,β,β-Trifluoro - Polymerization 3. Propene, 1,1-Dichloro-2-methyl 4. Dielectric research 5. Plastics - Dielectric properties 6. SIG Contract W36-039-SC-38105, Report no. 8.

Dept. of the Army project 3-93-00-500. Signal Corps project 2005. Project RC-7.

ULTRA-HIGH FREQUENCY HIGH TEMPERATURE DIELECTRIC MATERIALS. POLAROID CORP. RESEARCH DEPT., CAMBRIDGE, MASS. TRIMONTHLY PROGRESS REPORT NO. 9, PERIOD JUN 1-AUG 31, 1950, UNDER CONTRACT W36-039-SC-38105, by H. T. Wolosinoki and S. G. Cohen. Sep 1950. 31p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107574

1. Sytrene - Polymerization 2. Acetic acid, Trifluoro - Thermal decomposition 3. p-Xylene - Thermal decomposition 4. Styrene, α-Chloro-β, β-difluoro 5. Dielectric research 6. Plastics - Dielectric properties 7. SIG Contract W36-039-SC-38105, Report no. 9.

Project RC-7. Dept. of the Army project 3-93-00-500. Signal Corps project 2005.

Generators, Motors, Transmission Distribution, and Allied Equipment

OPERATION AND MAINTENANCE: 12-VOLT SPARK PLUG CLEANER AND TESTER (CHAMPION SPARK PLUG CO MODEL B-600 BB) (40-C-1011). U. S. Army. Jan 1952. 70p photos, drawings, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107563

1. Spark plug cleaners 2. Spark plugs - Testing equipment 3. WD TM 9-9013-1.

REPORT ON THE DEVELOPMENT OF TEST EQUIPMENT AND RESULTS IN CONNECTION WITH THE STUDY OF TRANSFORMER INSULATION SUBJECTED TO PULSE VOLTAGES. STANFORD UNIVERSITY, DEPT. OF ELECTRICAL ENGINEERING. RYAN LABORATORY, STANFORD, CALIF. FINAL (19TH) REPORT UNDER CONTRACT NO. W36-039-SC-32159 COVERING THE PERIOD MAR 1, 1949 TO FEB 28, 1951, by Joseph S. Carroll and William G. Hoover. Feb 1951. 59p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107673

1. Transformers, Power - Insulation - Tests 2. Transformers, Power - Insulation - Testing equipment 3. Corona discharges 4. Simulators, Electronic - Design.

Dept. of the Army project 3-26-00-600. Signal Corps project 2006. See PB 104088 for summary of results of work on this contract from June 1, 1946 to Feb 28, 1949. Research to be continued under Contract no. DA36-039-sc-5552.

RESEARCH AND DEVELOPMENT OF VARIOUS CONFIGURATIONS OF CORE MATERIALS FOR OPTIMUM TRANSFORMER DESIGN. BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO. 11TH QUARTERLY REPORT, OCT 1-DEC 31, 1951, ON CONTRACT NO. W-36-039-sc-38255, by C. F. Salt, W.T. Sackett, Jr., and R. C. McMaster. Dec 1951. 34p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107671

A discussion is presented concerning the causes of variability in transformer sheet steel. Typical ranges of properties to be expected in different grades of steel are presented as obtained from various sources. Samples of oriented silicon-steel material are being obtained in 14-mil, 4-mil, and 2-mil thicknesses and in Epstein, wound-core, and El-

lamination form. These samples will be so selected as to be representative of the upper 10 per cent. the average, and the lower 10 per cent of the core "population" based on core loss and exciting current. Magnetic-test data are presented for an experimental, oriented uncut wound core where both a-c and d-c excitation are used. Sixty-cps and 400-cps magnetization curves are shown for the fundamental, rms, and peak values of exciting current and various values of d-c core bias. Core-loss curves, permeability curves, and a-c B-H loops for different values of d-c cores bias are also given. Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 32-2006-3. Pages numbered 184-195.

RESEARCH AND DEVELOPMENT OF VARIOUS CONFIGURATIONS OF CORE MATERIALS FOR OPTIMUM TRANSFORMER DESIGN. BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO. 12TH QUARTERLY REPORT, JAN 1 TO MAR 31, 1952, ON CONTRACT NO. W36-039-SC-38255, by C. F. Salt, W. T. Sackett, Jr. and R. C. McMaster. Mar 1952. 55p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107672

Tests involving fifteen geometrically identical C-type wound cores are described in detail in this report. These fifteen cores were selected by the manufacturer in groups of five. One group was typical of the better cores being produced, one of the medium, and one of the poorer cores. Extensive test data are presented for three of the fifteen cores. These three cores were chosen carefully and can reasonably be expected to be representative of the better, average, and poorer cores for this type of configuration and material. The data include core-loss, permeability, and a-c magnetization curves for combined a-c and d-c excitation at frequencies of 60 cps and 400 cps. Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 32-2006-3. Pages numbered 196-201.

Miscellaneous

CABLE, R.F., COAXIAL, LOW CAPACITY, HIGH TEMPERATURE, BY G. E. DEPAOLA. PRODUCT DEVELOPMENT CO., INC., ARLINGTON, N. J. FINAL ENGINEERING REPORT AND ADDENDUM ON CONTRACT AF-33(038)-16691. Dec 1951. 18p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107514

1. Cables, Coaxial 2. Teflon (Trade name). Project no. XP-1250-187.

INTERFERENCE FIELDS ABOUT AIRCRAFT. LIGHTNING & TRANSIENTS RESEARCH INSTITUTE, MINNEAPOLIS, MINN. INTERIM ENGINEERING REPORT 183-2 FOR PERIOD MAR 8-JUN 8, 1952 UNDER CONTRACT AF18(600)-183. Jun 1952. 8p photo Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107515

The purpose of this investigation is to determine the magnitude and pattern of electromagnetic fields external to the skin of an all metal aircraft which results from circulating radio interference currents in the aircraft skin and interior wiring in the frequency range of 400 mc to 33,000 mc. The investigation is further directed towards establishing the fuselage signal reduction factor of the aircraft skin, the changes in the fuselage signal reduction factor resulting from openings in the aircraft skin, and the effects of the physical properties and dimensions of the aircraft on the external electromagnetic fields. LTRL T 210.

MINIATURIZED PULSE CABLE. FEDERAL TELECOMMUNICATION LABORATORIES, NUTLEY, N.J. INTERIM ENGINEERING REPORT NO. 1, QUARTER ENDING JULY 15, 1952, UNDER CONTRACT AF33-(600)-9424, by G. R. Leef and J. J. Albanes. Aug 1952. 30p drawings, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107723

Plan for the development of a miniaturized, Teflon-insulated pulse cable are discussed. Tentative designs for both coaxial and triaxial versions of the required cable are given. Preliminary experimental work on a Teflon-base semiconducting compound shows promise that thin semiconducting layers of satisfactory electrical conductivity can be applied by a dip-coating technique.

POWER - SYSTEM ARITHMETIC, by Herbert P. Peters. 1952. 6p diagr, graph, table Available from Georgia Institute of Technology, State Engineering Experiment Station, Atlanta, Ga. PB 107447

1. Engineering, Electrical - Research 2. Electric power - Calculations 3. Electrical measurements 4. Power - Measurements 5. Power control units 6. Voltage, High - Calculations 7. G EES R 58.

Reprint no. 58. Vol. XIV, no. 3, Jun 1952. Reprinted from Electric Light and Power, Apr. 1952.

Food and Kindred Products

GRAIN DRYING AND STORAGE IN GREAT BRITAIN. REPORT OF WORKING PARTY. Gt. Brit. Ministry of Agriculture and Fisheries. 1952. 32p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107480

1. Grain - Processing - Gt. Brit. 2. Grain - Storage - Gt. Brit.

Chairman: Sir Reginald Franklin. Contents: Part I: The size of the problem. - Part II: Remedies. - Summary and recommendation. Part I: Size of the problem. - Part II: Remedies. Appendix I: Estimates of grain cut by combine harvester. - Appendix II: Technical notes on farm drying and storage. - Appendix III: Sources of information. S. O. code no. 23-215.

MEAT PROCESSING RATION ISSUE. U. S. Army and U. S. Air Force. Feb 1952. 178p photos, diagrs Available from Library of Congress, Publication

Board Project, Washington 25, D. C. Microfilm $6.50, Photostat $22.50. PB 107541

1. Meat - Processing 2. Meat - Cutting 3. Beef - Processing 4. Lamb (Meat) - Processing 5. Beef - Frozen - Processing 6. Pork - Processing 7. Poultry - Processing 8. Seafood - Processing 9. Shellfish - Processing 10. Fat - Rendering 11. WD TM 10-418 12. AAF M 146-6.

This manual supersedes TM 10-407, 1 July 1943; TM 10-408, 1 July 1943; and TM 10-409, 1 Sep 1947, including C1, 23 July 1951.

Fuels and Lubricants

DEVELOPMENT OF QUALIFICATION TEST METHODS FOR GEAR LUBRICANTS. ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL. PROGRESS REPORT NO. 2 UNDER CONTRACT NO. DA-11-022-ORD-905, by H. Rowe Barton. Sep 1952. 13p fold drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107682

1. Gears - Lubrication 2. Lubricants - Testing equipment 3. ARF Proj 90-128OL, Report no. 2.

For report no. 1 see PB 107585.

Highways and Bridges

FINAL REPORT ON ROAD TEST ONE-MD: EFFECT OF CONTROLLED TRUCK AXLE LOADINGS ON CONCRETE PAVEMENT. Highway Research Board. 1952. 187p photos, diagrs, graphs (part fold), tables (part fold) Available from Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $2.25. PB 107681

1. Pavements, Concrete - Loads 2. Pavements, Concrete - Traffic tests 3. HRB SR4.

Instruments

AUTOMATIC ALTITUDE ADJUSTMENT FOR BOMBSIGHT MARK 20, by U.C.S. Dilks. Franklin Institute, Philadelphia, Pa. Jan 1944. 17p photos, diagrs, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107710

This attachment for setting altitude from an FM altimeter into the Bombsight Mark 20 would apply to any computing sight in which such a setting is required. Report no. 330-1706-161. Contract OEMsr-330, Project no. NO129, period covered 20 Oct 1943-24 Jan 1944. Office of Scientific Research and Development, National Defense Research Committee, Division 7, Section 7.2 OSRD 5080.

HANDBOOK OF OPERATION AND SERVICE INSTRUCTIONS FOR MAGNESYN MANIFOLD PRESSURE TRANSMITTER, NAVY STOCK NO. R88-T-2315, PART NO. 22200-8-A5 AND MAGNESYN MANIFOLD PRESSURE SINGLE INDICATOR, NAVY STOCK NO. R88-I-1635, PART NO. 20000-3B-4-A1 (ECLIPSE-PIONEER). U. S. Air Force and U. S. Bureau of Aeronautics. Jul 1948. 16p photos, drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107371

1. R88-T-2315 (Pressure transmitter) 2. R88-I-1635 (Pressure indicator) 3. Indicators, Pressure - Maintenance and repair 4. Transmitters, Pressure - Maintenance and repair 5. AN 05-70D-12.

HANDBOOK, OPERATION AND SERVICE INSTRUCTIONS: MULTIMETER TS-352/U. U. S. Air Force. May 1951. 12p photos, diagr, tables Available from Library of Congress, Publication Board, Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107736

1. TS-352/U (Multimeter) 2. Multimeters - Maintenance and repair 3. AAF TO 16-35 TS 352-6.

HANDBOOK, OPERATION AND SERVICE INSTRUCTIONS: MULTIMETER TS-352/U. U. S. Air Force. Revised. Dec 1951. 9p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107736r

1. AAF TO 16-35 TS 352-6 revised.

Revision of PB 107736.

HANDBOOK, OVERHAUL INSTRUCTIONS: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Oct 1951. 258p photos, drawings, diagrs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $32.50. PB 107730r

1. Indicators, Position - Maintenance and repair 2. Transmitters, Position - Maintenance and repair 3. AN 05-55A-13 revised.

HANDBOOK, OVERHAUL INSTRUCTIONS: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Jan 1952. 15p photos, drawing, diagrs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107730r2

Revision of AN 05-55A-13 Nov 1949.

INVESTIGATIONS OF THE MEASUREMENT OF NOISE. PROGRESS REPORT NO. 25, APR 1-JUN 30, 1952 UNDER CONTRACT NOBSR 49128, INDEX NE120803, by David B. Geselowitz and Francis T. Nicholson. Pennsylvania. University. Moore School of Electrical Engineering. Jul 1952. 83p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 107597

1. Noise - Measurement 2. Meters, Sound 3. Noise - Frequency distribution.

Research Division report no. 53-03. For reports no. 1-23 see PB 85974-85981, 110114-110119,

101545-101546, 103055-103057, 105003, 106603-106604, 107104.

PARTS CATALOG: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Oct 1950. 131p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 107731r

1. Indicators, Position - Parts 2. Transmitters, Position - Parts.

Revision of AN 05-55A-14 Jun 1949.

PARTS CATALOG: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Jun 1951. 59p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107731r2

Revision of AN 05-55A-14 Jun 1949.

PARTS CATALOG: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Dec 1951. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107731r3

Revision of AN 05-55A-14 Jun 1949.

PARTS CATALOG: D-C SELSYN POSITION INDICATORS AND TRANSMITTERS (GENERAL ELECTRIC). U. S. Air Force and U. S. Bureau of Aeronautics. Revised. Mar 1952. 11p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107731r4

Revision of AN 05-55A-14 Jun 1949.

PARTS CATALOG: MULTIMETER TS-352/U. U. S. Air Force. Jul 1950. 24p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107735

1. TS 352/U (Multimeter) 2. Multimeter, Electronic - Parts 3. AAF TO 16-35 TS 352-4.

SCALER USING DEKATRON SCALING TUBES. NOTE ON THE CROSS SECTION OF THE REACTION 31P $(N,P)^{31}SI$, by Ingvar Nilsson. Chalmers University of Technology, Gothenburg, Sweden. Laboratory for Nuclear Chemistry. 1952. 10p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107365

1. Dekatron (Trade name) 2. Scalers - Sweden 3. Neutrons - Cross sections - Sweden 4. Atomic power - Research - Sweden 5. Chalmers University of Technology, Gothenburg, Sweden. Transactions no. 125.

SYMPOSIUM ON COMMERCIALLY AVAILABLE GENERAL-PURPOSE ELECTRONIC DIGITAL COMPUTERS OF MODERATE PRICE, THE PENTAGON, WASHINGTON, D. C., 14 MAY 1952. U. S. Office of Naval Research. Navy Mathematical Computing Advisory Panel. May 1952. 46p photos, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.25. PB 111043

1. Computers, Digital 2. Computers, Electronic 3. Jaincomp B-1 (Computer) 4. Monrobot (Computer) 5. Cadac (Computer) 6. Circle computer 7. Elecom 100 (Computer) 8. Model 30-201 (Computer) 9. Miniac (Computer).

Contents: Jaincomp-B1 computer, by Donald H. Jacobs, Jacobs Instrument Co., Bethesda, Md. - Monrobot electric calculators, by E. J. Quinby, Monroe Calculating Machine Co., Orange, N. J. - The Cadac, by R. E. Sprague, Computer Research Corporation, Hawthorne, Calif. - Circle computer, by John Greig, Hogan Laboratories, New York. - Elecom 100, by Albert Auerbach, Electronic Computer Corp., Brooklyn, N. Y. - Model 30-201 electronic digital computer, by L. P. Robinson, Consolidated Engineering Corp., Pasadena, Calif. - The Miniac, by George B. Green, Physical Research Laboratories, Pasadena, Calif.

UPPER ATMOSPHERE RESEARCH REPORT NO. XVII: SOLAR ASPECT INDICATOR FOR A ROCKET, by D. M. Packer and R. Tousey. U. S. Naval Research Laboratory. Sep 1952. 14p photo, diagrs, graph Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111056

A small, lightweight and inexpensive photoelectric sensing unit has been developed that indicates, through telemetering during flight of a rocket, the aspect angles of the missile relative to the sun. Aspect and roll-rate data are obtained with an accuracy of better than ± 2 over a field-of-view angle of 115°. The device consists of a simple, cemented-doublet lens that images the sun upon a thin hemispherical metal reticle conforming to the secondary focal plane of the lens, a chamber for collecting the sunlight passing through openings in the reticle, and a phototube for detecting this light. Since the aspect data are derived from the times of change of photocurrent and the geometry of the reticle, no calibration of the unit is required and telemetered information is independent of signal amplitude. The construction and operation of the indicator are described and the results obtained on a successful rocket flight are presented. NRL R 4024.

Leather and Leather Products

BOOKBINDING LEATHER, by Morris S. Kantrowitz and George G. Groome. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 11p diagr, tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107620

1. Leather - Specifications 2. Leather - Tests 3. Bookbindery - Materials.

GPO-PIA joint research bulletin, bindery series no. 5.

Lumber and Wood Products

TANNIN FROM WASTE BARK. Northeastern Wood Utilization Council, New Haven, Conn. Sep 1952. 32p graph, tables Available from Northeastern Wood Utilization Council, P. O. Box 1577, New Haven, Conn. $2.50. PB 107479

1. Bark - Separation 2. Tannin - Extraction 3. Tannin industry - New England 4. NWUC B39.

Contents: Foreword. - Tannin material situation, by W. E. Hillis. - Tanning industry in New England, by Kenneth E. Bell. - Opération of a tannin extraction plant, by Edwin S. Flinn. - Potential tannin supplies from domestic barks, by Jerome S. Rogers. - Methods of bark separation: Air flotation method, by G. W. Jarman. - Thermo-pressure method. - Cyclone method. - Portable debarkers.

Machinery

CHARACTERISTICS OF THE "3 FT-LB" VIBRATION MACHINE, by R. W. Conrad. U. S. Naval Research Laboratory. Oct 1947. 15p photos, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111047

Measurements of displacement, velocity, and acceleration were taken at the center of the load plate. The load plane evidenced resonances whenever the hammer frequency coincided with an integral subharmonic of the load plate's natural frequency. The vibration amplitude was very unstable at high values. It is suggested that vibration machines having directly controllable amplitudes and frequencies be substituted for the subject machine. NRL S 3186.

CHARACTERISTICS OF THE 250 FT-LB SHOCK MACHINE, by R. W. Conrad. U. S. Naval Research Laboratory. Jul 1948. 28p photo, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111045

Study of shock machine to determine its characteristics under various conditions of loading and direction of hammer blow. Data were taken with each of two different weight hammers in general use. Measurements were taken at load position of displacement, velocity, and acceleration as the panel load was varied from zero to 187 lb. Since the Navy Light-Weight High-Impact Shock Machine more closely simulates conditions in the field and contains all principal components present in subject machine it is recommended that use of 250 Ft-lb Shock Machine be discontinued. NRL F-3328.

DEVELOPMENT OF HERMETICALLY SEALED ELECTRIC MOTOR. FINAL ENGINEERING REPORT UNDER CONTRACT NO. AF33(038)-7829, by William A. Plice, J. E. Mullen and Hugh S. Knowles. Industrial Research Products, Inc., Franklin Park, Ill. Jun 1951. 32p drawings (1 fold), graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107678

Described is development of a hermetically sealed motor gear reducer combination designed to meet as fully as possible performance and size objectives of MCREE-528. This report also describes and gives results of a comprehensive experimental program of testing and performance of various materials and designs in the service environment specified. Due to lack of available information on use and suitability of materials when operated under extreme environmental conditions specified, investigation of and experimentation with materials was a major part of the task. Many materials which proved satisfactory are expensive and/or difficult to handle in production and some are available only in limited quantity. Five of the 13 experimental motors constructed and tested are described and performance data given.

EFFECT OF DECARBURIZATION AND OTHER FACTORS ON THE FATIGUE STRENGTH OF ROLL-THREADED AIRCRAFT BOLTS, by I. Weibull. Svenska Aeroplan Aktiebolaget, Linköping, Sweden. Jul 1952. 19p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107754

The main operations in manufacturing roll-threaded aircraft bolts are described. The most important non-dimensional defects of such bolts are decarburization and laps. The investigations carried out showed that the fatigue strength of the bolts was seriously affected by certain types of laps but only slightly by decarburization. It was round too that threading after heat-treating increased the fatigue limit considerably and that cadmium plating had a very slight, if any effect. SAAB TN 4.

INTERNAL COMBUSTION ENGINE PART AND INSTRUCTION BOOKS: CHRYSLER CROWN MODEL M-7, GENERAL MOTORS MODELS 3-268A, 8-278A, 12-278A KOHLER 1 1/2 & 2KW MODELS, NATIONAL SUPPLY MODEL GBD-8, WESTINGHOUSE MARINE DIESEL ENGINES. U. S. Bureau of Ships. n.d. 1009f photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $132.50. PB 107612

1. Engines, Internal combustion - Maintenance and repair 2. Engines, Internal combustion - Parts 3. Engines, Diesel - Marine 4. M-7 (Engine) 5. 3-268A (Engine) 6. 8-278A (Engine) 7. 12-278A (Engine) 8. GBD-8 (Engine) 9. Micro NAVSHIPS D6110.

ORGANIZATION AND OPERATION OF AN INDUSTRIAL MAINTENANCE DEPARTMENT, by Robert Ostrem Mitterling. Aug 1950. 145p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 107752

A study of maintenance in industry is reported. This investigation made in the following phases: constitution of the maintenance function, position within the organizational structure, scope of activities, size, forms of organization currently used, operating procedures including work control and cost control, preventive maintenance, records and forms,

and wage incentives. The discussion is limited to an evaluation of the basic principles and techniques of organization and operation underlying a modern industrial maintenance department. Conclusions are drawn which are considered valid for the functioning of an efficient maintenance plant. Thesis-University of Texas. May not reproduce well.

SHORT-BEARINGS APPROXIMATION FOR FULL JOURNAL HEARINGS, by F. W. Ocvirk. U. S. National Advisory Committee for Aeronautics. Oct 1952. 61p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107689

A short-bearing approximation of pressure distribution in the oil film is presented which is an extension of the pressure-distribution function of Michell and Cardullo and includes end-leakage effects. Equations giving applied load, attitude angle, location and magnitude of peak film pressure, friction, and required oil flow rate as functions of the eccentricity ratio are also given. The capacity number, a basic nondimensional quantity resulting from this analysis, is the product of the Sommerfeld number and the square of the length-diameter ratio. Curves determined by this analysis are compared with previously published experimental data and theoretical curves of Sommerfeld and Cameron and Wood. Conclusions reached indicate that this approximation is of practical value for analysis of short bearings. NACA TN 2808.

SPEED EFFECT IN COPPER CRUSHER CYLINDERS AND COPPER SPHERES, by Frederick Seitz, Jr., Andrew W. Lawson and Park H. Miller. U. S. National Defense Research Committee. Jun 1942. 9p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107772

The effect of speed on the load-strain curves of copper crusher cylinders and copper spheres has been determined with the use of the compression machine at the University of Pennsylvania. The results show that there is a speed effect of about 20 percent in the cylinders and one of about 30 percent in the spheres. The speeds compared are the so-called static value, which corresponds to a strain rate of about 0.5 sec^{-1}, and the dynamic values in the range from 400 to 1200 sec^{-1}. Work in progress at University of Pennsylvania under Contract OEMsr-132. OSRD 619.

Medical Research and Practice

CELL DIVISION IN THE GIANT AMOEBA, PELOMYXA CAROLINENSIS, FOLLOWING X-IRRADIATION: A. THERAPEUTIC EFFECTS AFTER FUSION WITH EITHER NONIRRADIATED LIGHT OR HEAVY HALVES OF CENTRIFUGED AMOEBAE IMMEDIATELY FOLLOWING EXPOSURE, by Edward W. Daniels. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1952. 13p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107645

Pelomyxae were exposed to 70,000 r and then fused to either nonirradiated centripetal or nonirradiated centrifugal halves. The delay in cell division due to x-irradiation was essentially prevented. The rate of reproduction was about the same regardless of whether a light or a heavy half was used. Thus rapid recovery in the division rate following exposure to x-rays can be brought about in Pelomyxa by adding living protoplasm to each cell. It also shows that the essentially enucleate cytoplasm is as active in this regard as the centrifugal half which contains 96 percent of the nuclei as well as certain cytoplasmic particulates which are not characteristic of the centripetal half. AAF SAM Project no. 21-47-005, Report no. 5.

EXPERIMENTAL IMMERSION LEG, by R. B. Lewis and P. W. Moen. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1952. 13p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107532

The pathologic tissue changes in experimental "immersion leg" are identical to those observed in experimental "frostbite." Necrosis of skin begins in the most superficial layers and progresses through the epithelium and dermis and eventually involves subcutaneous tissue. Muscle changes include the same three lesions as in frostbite; in the order of decreasing severity, they are (1) coagulation necrosis, (2) slow necrosis, and (3) atrophy. In some but not all legs these are layered from the surface in the order of decreasing severity as is the case in frostbite and bum injuries. We believe immersion leg as well as frostbite and burns to be true thermal injuries. AAF SAM Project 21-23-006, Report no. 14.

"FLY FACTOR" IN ATTRACTANT STUDIES, by Clyde S. Bamhart and Leigh E. Chadwick. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1952. 9p photo, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107640

1. Musca domestica - Attractants 2. CC MD RR 127.

Project no. 4-11-04-004.

THERAPEUTIC PROCEDURE FOR EXTERNAL OTITIS, by James E. Lett. U. S. Air Force. School of Aviation Medicine. Randolph Field, Texas. Aug 1952. 7p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107534

Laboratory evidence of the past few years has pointed more and more toward bacteria as the etiologic agents in external otitis. Fungi apparently have little to do with the development of symptoms or disease processes. Many investigations incriminate Pseudomonas aeruginosa as the most commonly found pathogen. In a previous report, in vitro studies indicated that the drug, sulfamylon, exerted more inhibitory effect than did the antibiotics. A therapeutic plan, incorporating this drug, and following sound physiologic principles, was evolved. AAF SAM Project 21-32-026, Report no. 1.

THICKNESS ADJUSTMENTS OF GLASS FILTERS TO GIVEN TOTAL TRANSMITTANCE, by Hermann von Schelling. U. S. Navy. Medical Research Laboratory, Naval Submarine Base, New London, Conn. Mar 1952. 28p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107345

Investigators in the field of colored lighting are frequently faced with the problem of specifying the thickness of glass filters to obtain a certain transmittance and chromaticity. Either of two problems may arise: (1) One may wish to find the chromaticity and the total transmittance for a specified new thickness; or (2) to calculate the thickness which corresponds to a requested total transmittance. A new graph is provided from which the transmittances of filters of the same melt, but of different thicknesses, can be determined for any wave-length. Eight selected transmittance curves are given as a key for finding a good first approximation for the thickness of a filter which will produce a specified total transmittance. The procedure presented reduces this task to a routine which can be carried out without special training in color or mathematics. All of the tables and diagrams required in the calculation are provided with the exception of two handbook sources which are indicated. Bureau of Medicine and Surgery, Navy Department, Project NM 003 041.40.02. Medical Research Laboratory Report no. 193, Volume XI, no. 10. NAV MRL 193.

Metals and Metal Products

ANALYSIS OF COBALT-URANIUM ALLOYS, AN A.E.R.E. REPORT, by G.W.C. Milner and R. Macara. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 9p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107649

A satisfactory scheme is described for the complete analysis of cobalt uranium alloys containing from small amounts to approximately 40% of cobalt. The cobalt is determined volumetrically using the titration based on the oxidation of cobaltous ions in ammoniacal solution with standard potassium ferricyanide. Uranium is separated from cobalt by a double precipitation as ammonium diuranate and finally ignited to U_3O_8. Silicon is determined by the usual dehydrating procedure of fuming with sulphuric acid and determining any loss in weight on treating the residue with hydrofluoric acid. Other elements occur in this type of alloy in trace amounts only and the spectrographic technique is satisfactory for the determination of their concentrations. For the major alloying constituents the method is suitable for the determination of cobalt contents up to 40% to an accuracy of $\pm$0.25% at the upper limit and uranium contents to an accuracy of $\pm$0.1%. Appendix I: Recommended procedure for cobalt-uranium alloys. HD 602. S. O. code no. 70-674-0-52. AERE C/R 796.

APPLICATION OF SHELL MOLDING TO THE PRODUCTION OF MAGNESIUM CASTINGS. FINAL REPORT UNDER CONTRACT NO. DA-20-018-ORD-11664. Dow Chemical Co., Midland, Mich. 1952. 29p photos, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111049

The inhibitor requirements of shell molds were studied by applying inhibitors as mold washes, mold flushes, and sand-resin mix additions. Ammonium borofluoride yielded the best results as an addition agent while boric acid and Dow #181 Agent (essentially sulfur and boric acid) served best as mold washes when casting AZ92A Alloy (Mg-9A1-2Zn) in shell molds. The effects of varying resin concentration, resin formulation, and inhibitor additions were studied in an effort to improve shell core breakdown. Urea-phenol formaldehyde and furfural-phenol formaldehyde showed the most promise as binders for shell cores. Tests for the evaluation of sand-resin mixes were developed. The principles developed in the investigation were applied to a production casting and the metal quality of the production part was compared with the same part cast in green sand and permanent molds. The tensile properties of shell mold castings were equivalent to the other castings tested.

BRONZE STAMPING LEAF, by Morris S. Kantrowitz and Frederick R. Blaylock. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 10p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107621

1. Stamping, Metal.

GPO-PIA joint research bulletin, bindery no. 6.

FATIGUE TESTS ON TYPICAL TWO SPAR LIGHT ALLOY STRUCTURES (METEOR 4 TAILPLANES) UNDER REVERSED LOADING, by K. D. Raithby. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1951. 24p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 107482

Results are given for fatigue tests on six Meteor 4 tailplanes, vibrated in flexure under simple reversed loading, ranging from $\pm$10% to $\pm$30% of the static failing load. Corresponding endurances varied from about 5×10^6 to 0.06×10^6 cycles, for complete failure of a spar boom. In each test the alternating load was kept constant, although progressive skin cracking caused a considerable change in alternating stress at the section where eventual failure of the spar boom occurred. The test results are discussed in relation to the establishment of endurance curves for a typical two spar structure. C. O. no. 88. Report no. Structures 108. Contents: Appendix I: Method of tests. - Appendix II: Derivation of corrected endurance curves for rear spar. ARC CP 88.

MAGNESIUM PLATES, by Fred J. Hartman. U. S. Government Printing Office and Printing Industry of America, Inc. 1949. 31p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $3.00. PB 107614

1. Films (Photography) - Magnesium 2. Magnesium alloys - Use in photoengraving 3. Photoengraving plates, Magnesium.

GPO-PIA joint research bulletin, plate series no. 1.

Appendix A: Application of magnesium alloys in photoengraving and allied printing technique, by H. E. Swayze. - Appendix B: Bulletin of National Board of Fire Underwriters on magnesium fires. - Appendix C: Selected comments from users of magnesium plates. - Appendix D: Bibliography.

PAST WORK ON FATIGUE OF METALS IN THE HIGH TEMPERATURE FIELD, by Thomas J. Dolan. Illinois. University. Dept. of Theoretical and Applied Mechanics, Urbana, Ill. Jun 1950. 49p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107702

A review is made of the principal concepts of high-temperature fatigue behavior of metals as obtained from laboratory investigations. The interaction between time-dependent creep, and cycle-dependent fatigue phenomena apparently results in a rate of progressive damage which may be quite different from predicted from simple superposition of effects obtained in separate tests. In evaluating the significance of data from high-temperature fatigue tests, the following factors must be given careful consideration: (a) the frequency of repetition of the stress cycle; (b) the metallurgical instability of most metals at high temperature; (c) the influence of surface effects (erosion, oxidation, or chemical changes); (d) the accentuation of time-dependent creep caused by the superposition of a mean or steady stress; and (e) the lack of knowledge regarding the reduction of fatigue strength caused by "stress raisers". It is concluded that fundamental information is needed on the nature of the phenomena limiting the life of a metal in high temperature fatigue before accurate methods can be evolved for prediction of useful service life of specific components. Contract N6ori-71, T. O. IV, Project NR-031-005. Presented at a conference on "Fatigue of Metals at High Temperature" sponsored by the Materials Panel of Project Squid, in Washington, D. C., May 24, 1950. ILU EES TR 17.

REPORT OF INVESTIGATION OF THE SHELL MOLDING PROCESS, by B. N. Ames and S. B. Donner. U. S. Naval Shipyard, New York. Material Laboratory. Apr 1952. 58p photos, graphs, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $1.50. PB 111004

This report presents data on the further development of the shell molding process, the preliminary results of which were reported previously in Progress Report 1. Data are included herein for the improvement of process techniques and materials; the design of suitable production equipment and the metallurgical evaluation of the process in the aluminum alloys and tin bronzes. It was concluded that the shell molding process when applied to the proper casting design is an economical foundry technique which will permit the utilization of lower grade skills; improve metal yield; reduce machine shop time and cleaning costs; produce castings in aluminum alloys, grey iron and ductile iron in the weights described in this report to tolerances of 0.003" per inch; and produce castings in aluminum alloys and tin bronzes which are comparable with sand castings from the standpoint of internal soundness and physical properties. In addition, it was determined that medium carbon and highly alloyed steel castings can be produced by the shell molding process with satisfactory surfaces and internally sound but that additional development work is required in reproducing close dimensional requirements in these alloys. Lab. project 5118, Progress report 2.

TITANIUM-ALUMINUM-CHROMIUM ALLOYS. FINAL REPORT, FEB 1, 1951 TO JAN 31, 1952, UNDER CONTRACT NO. NOA(S)51-331-C, by E. Ence, H. Margolin, J. P. Nielsen. New York University. College of Engineering Research Division. Jan 1952. 41p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107716

The data are presented in the form of isothermal and constant composition sections and are discussed in terms of information available in the literature. Phase relationships for four isothermal sections in the temperature region 650-1050°C and in the composition range up to 60% Cr and 45% Al have been prepared on the basis of data obtained from alloys containing up to 10% chromium or aluminum. Metallographic methods for specimen preparation and phase identification are described and characteristic microstructures are included.

TYPE METALS, by Morris S. Kantrowitz, Clarence L. Buck, and William C. Roddy. U. S. Government Printing Office and Printing Industry of America, Inc. 1949. 19p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107615

1. Type and type founding 2. Alloys, Light metal - Uses.

GPO-PIA joint research bulletin, composing room series no. 1.

Meteorology and Climatology

HORIZONTAL ATTENUATION OF ULTRAVIOLET AND VISIBLE LIGHT BY THE LOWER ATMOSPHERE, by Lawrence Dunkelman. U. S. Naval Research Laboratory. Sep 1952. 21p graphs (part fold), tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111057

The horizontal attenuation of ultraviolet and visible light by the lower atmosphere has been measured at night in city, desert, and sea atmospheres under conditions ranging from fog to exceptionally clear air. The researches are summarized and the data are presented in the form of representative spectral attenuation curves for all the locations investigated and in tables of spectral attenuation coefficients for the locations where sufficient data were obtained to warrant their preparation, for various visibilities. The tables are intended for those who require a survey of typical spectral attenuation characteristics of the lower atmosphere. For those requiring accurate coefficients for a given time and place, there are given references to methods for making the required measurements. A diagram is given for converting between the attenuation coefficients, δ (base e) and

σ_{10}(base 10) and transmittance t, per sea mile and per kilometer. Cautions in selection and use of tables are given and the effects of field of view and of gaseous absorption are discussed. NRL R 4031.

THICKNESS EVALUATION CHARTS AND TABLES. U. S. Air Force. Air Weather Service, Andrews Air Force Base, Washington, D. C. Dec 1950. 20p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107769

1. Weather charts - Preparation 2. Atmosphere - Density - Tables 3. AAF AWS 105-66.

Minerals and Mineral Products

DEVELOPMENT OF SIZINGS FOR GLASS FABRIC IN POLYESTER-RESIN LAMINATES, by Luther L. Yeager, James E. Henning, Stephen V. T. Marshall, Robert P. Cox. Bjorksten Research Laboratories, Inc., Madison, Wis. Sep 1951. 115p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 107770

The wet-strength properties of low-pressure glass-fabric base-polyester resin laminates have been greatly improved by the development of a suitable sizing material for application to the cleaned glass fabric before laminating with the polyester resins. After preliminary evaluation of many materials, the final sizing developed was vinyl dichloro silane, in conjunction with beta chloro allyl alcohol, applied to heat-cleaned glass fabric. The application procedure consisted of immersion of the fabric in a xylol solution of vinyl dichloro silane and beta chloro allyl alcohol for 15 minutes at 80°F., drying, washing with water, and redrying. Air Force Contract no. (33-038)-8902. AAF TR 6220.

INVESTIGATION OF A METHOD OF CASTING CERMETS DISPERSED BY MECHANICAL MEANS, by E. W. Holman and E. J. Soxman. New York State College of Ceramics, Alfred, N. Y. Aug 1951. 21p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107676

The principal problem involved was the dispersion of one component in the other to the extent that a homogeneous mixture was formed of such stability that the degree of segregation was kept to a minimum prior to solidification of the melt in the mold. Mechanical agitation was employed to effect the desired dispersion. A dispersion of bronze in salt and in sodium silicate in the form of spheres ranging in size from colloidal to 1 mm in diameter was accomplished by the use of a hollow slotted graphite rotor in an inductively heated graphite crucible containing vertical slots in its walls. It is concluded that this method of agitation and dispersion offers the most promise. Contract no. W33-038-ac-14233. AAF TR 6550.

INVESTIGATIONS OF RARE EARTH PROBLEMS. QUARTERLY PROGRESS REPORT NO. 9 UNDER CONTRACT N6ORI-71, CHEMISTRY TASK NO. VII, PERIOD JUNE 1-SEP 1, 1948. Illinois. University, Urbana, Ill. Oct 1948. 34p graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107698

1. Earths, Rare - Spectrographic analysis 2. Earths, Rare - Phosphoric acid derivatives 3. Earths, Rare - Atomic weights 4. Thorium - Determination 5. Praseodymium - Analysis - Hydrazine method 6. Lanthanum - Ion exchange.

For 8th, 10th-11th progress reports see PB 107697, 99401, 107700; for final report see PB 107701.

INVESTIGATIONS OF RARE EARTH PROBLEMS. QUARTERLY PROGRESS REPORT NO. 11 UNDER CONTRACT N6ORI-71, CHEMISTRY TASK NO. VII, PERIOD DEC 1, 1948-MAR 1, 1949. Illinois. University, Urbana, Ill. Mar 1949. 46p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 107700

1. Earths, Rare - Spectrographic analysis 2. Lanthanum - Ion exchange 3. Cerium chlorides - Absorption spectra 4. Neodymium dichloroxinate - Absorption spectra 5. Praseodymium - Stabilization 6. Praseodymium oxides - Structure 7. Quinoline, 8-Hydroxy - Production 8. Sequestrene (Trade name) 9. Thorium hypophosphate - Exchange reactions.

For 8th-10th progress reports see PB 107697-107698, 99401; for final report see PB 107701.

OBSERVATIONS ON THE RARE EARTHS: 8-QUINOLINOL AND SUBSTITUTED 8-QUINOLINOL CHELATES OF CERTAIN RARE EARTH ELEMENTS, BY DALE EDWARD JACKSON. ILLINOIS. UNIVERSITY, URBANA, ILL. TECHNICAL REPORT UNDER CONTRACT N6ORI-71, CHEMISTRY TASK VII. Sep 1950. 101p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 107703

Investigations were conducted on the preparation and properties of the chelates of certain rare-earth elements with oxine and its 5,7-dichloro derivative. The rare-earth materials used were La_2O_3, Pr_6O, Nd_2O_3, Sm_2O_3, Er_2O_3, and Y_2O_3.

Ordnance and Accessories

FLASH PHOTOGRAPHS OF BULLET PENETRATION IN BRITISH PLASTIC ARMOR, by C. W. Curtis, R.G. Stoner and John Pittenger. U. S. National Defense Research Committee. Nov 1942. 9p photos, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107774

1. Armor, Plastic - Ballistic tests 2. Projectiles, Armor piercing - Photography 3. NDRC Memo A-60M 4. OSRD 1068.

Photographs taken by group engaged in work on bullet penetration at Princeton University under Contract no. OEMsr-260.

TECHNICAL REPORTS News letter

PUBLISHED MONTHLY

U. S. DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES
WASHINGTON 25, D. C.

NO. 42, DECEMBER 1952

BETTER SIZE SYSTEM FOR MEN'S SHOE INDUSTRY

A scientifically developed system for men's shoe sizes that will permit shoe fitting and more correct shoe manufacture is described in a new government research report.

Scientists in the Army Quartermaster Corps found that the eight important dimensions of standard lasts, in changing from one size to another, are not changed in the same proportions as the actual foot dimensions. So they devised a new system in which the rate of increase or decrease of each of these dimensions from the basic Size 8-D differs from that of conventional systems. But in the new system these and other dimensions are adjusted by new sizing formulas that result in improved last shapes, especially in the larger and smaller sizes. Title of the report describing this development is, APPLICATION OF FOOT MEASUREMENTS IN THE DEVELOPMENT OF LAST SYSTEMS.

The report also points out the non-scientific nature of the existing commercial men's-shoe-sizing-system; the progress made by the Army in adopting the Munson last; and the needs still to be met in developing a shoe-sizing-system which will insure the health and comfort of the foot and will at the same time reduce to a minimum the logistics problem of outfitting an army with shoes.

In addition, the report describes large-scale surveys that were made of the foot dimensions of Army men and points out what these surveys showed was wrong with existing procedures for designing men's shoe lasts. Code No. of Report, PB 111052. 54 pages, Mimeo $1.50. Order from OTS. See Instructions, page 4.

CUTTING OILS AND COOLANTS

The characteristics of cutting oils and coolants, and their proper use on various materials are described in the latest phamphlet in the Small Defense Plants Administration's series of TECHNICAL AIDS. The phamphlet details how to obtain the most satisfactory results when cutting aluminum, copper, steel, stainless steel, and special-treatment steels, and lists fundamental DO'S AND DON'TS. Included are directions on how to obtain a free bibliography of carefully selected publications on oils and coolants just prepared by OTS.

Order Technical Aid No. 13. Available free from all Commerce Department and Small Defense Plants Administration field offices.

U. S. DEPARTMENT OF COMMERCE
Charles Sawyer, Secretary

OFFICE OF TECHNICAL SERVICES
John C. Green, Director

TECHNICAL REPORTS NEWSLETTER

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Note: Subject matter of the reports themselves may be covered by patents.

Published with approval of the Director, Bureau of the Budget, September 29, 1952.

MORE DURABLE SEWED GARMENTS

The conventional method of testing a cloth for its ability to withstand sewing damage (sewability) is to count the percentage of threads broken off by the sewing action. However, tests developed by the Army Quartermaster Corps Laboratories prove that the ratio of the strength of the cloth before sewing, to its strength after sewing, gives a more reliable indication of how well the fabric withstands sewing damage. With this new test, fabrics that will not stand up at the seams can be effectively eliminated.

The Quartermaster Corps research report which describes the development of this test points out that it is more sensitive and more reproducible than the conventional test. A Government specification of cloth sewability based on this test is included. Code No. of Report, PB 111023, Mimeo $.50. Order from OTS. See Instructions, page 4.

PRODUCTIVITY IN BRUSH MANUFACTURING

A British Productivity team studying American methods of manufacturing brushes found that much of the high productivity at reduced cost in the U. S. brush industry is due to planned layout and mechanization of factories, improved quality and cost control methods, the use of synthetic materials, and a high degree of cooperation between labor and management. In addition to this analysis, their 54-page, well illustrated, report has a good section on AMERICAN TECHNIQUES which discusses: Materials Handling and Servicing; Economical Use of Labour Force; Preparation of Materials; Jigs, Tools and Small Machines; and Industrial Brushes. Code No. of Report, PB 106433, Price $.65. Order from OTS. See Instructions, page 4.

COLOR CODING

Industry uses many "symbol" codes to help operators in machinery operation, in servicing procedures, in safety practices, etc. What shapes, sizes, and colors should be used in these symbols so they can be most readily identified by the human operator? This problem is particularly critical in our present complex war equipment, so scientists working for the Navy's Special Devices Center made a study to find the answers Their findings are given in their report entitled "The Speed and Accuracy of Discriminating Differences in Hue, Brilliance, Area and Shape." Code No. of Report, PB 111040, Mimeo $.75. Order from OTS. See Instructions, page 4.

CRASH SAFETY DEVELOPMENTS

What happens to the human body when it travels at high speed and is brought to a sudden stop is the subject of a report in the Air Force's research program on Human Exposure to Linear Deceleration. It describes 53 experiments in which human volunteers were subjected to crash-like decelerations. The resulting strains on the safety harness holding the subject were measured and recorded by automatic instruments. Physiological and clinical tests were made before and after all the simulated crashes

The report describes the equipment used for producing the decelerations and the instrumentation used for gathering the data; discusses Human Tolerance to Linear Deceleration; and points out the principles of crash harness design and requirements for adequate protection. Code of Report, PB 106572, 149 pages, Microfilm $6.25, Photostat $21.25. Order from LC. See Instructions, page 4.

PROTECTION FROM ATOMIC RADIATION

Scientists have known for some time that certain chemicals, if injected before exposure to ionizing radiation, would reduce the harmful effects of these radiations on the body. A report by the U. S. Naval Radiological Defense Laboratory describes experiments in which it was found that a spleen homogenate would greatly reduce harmful effects of these radiations on mice if injected even as long as 45 hours after exposure. The report also advises that "The data suggest a possible quantitative relationship between the amount of spleen substance injected and the degree of protection obtained." Code No. of Report, PB 106731. Microfilm $1.75 Photostat $2.50. Order from LC. See Instructions, page 4.

RAPID GAS ANALYZER

An eight-year program of research on the physiological mechanism of human breathing, carried out for the Air Force by the University of Rochester School of Medicine and Dentistry, led to several basic ideas on the process of breathing.

A report summarizing this program points out that the scientists also developed new techniques and new instruments for gas analysis that may have application to other fields of medical and industrial research. Among the more significant of these advances are those on: The Burning of CO to CO_2 by Isolated Tissues as Shown by the Use of Radioactive Carbon; A Rapid Infra-red Gas Analyzer; Mechanics of Respiration; Ballistocardiographic Study of Changes in Cardiac output Due to Respiration: and The Pressure-Volume Diagram of the Thorax and Lung. Code No. of Report, PB 106704, 559 pages. Microfilm $9.00, Photostat $70.00. Order from LC. See Instructions, page 4.

GUIDES TO RESEARCH ON TITANIUM

When rapid technological advance is taking place in a particular field the Office of Technical Services prepares a list (Bibliography) of the Government research reports in that field available in the OTS technical report collection. One of these Bibliographies, which has been in great demand, is now available in a revision which includes latest material.

Entitled SELECTED BIBLIOGRAPHY OF REPORTS ON TITANIUM, it is a comprehensive list of about 200 reports grouped into these subject areas: Titanium; Titanium Alloys; Titanium Carbides; Titanium Compounds; Titanium Dioxide; Titanium Monoxide; Titanium Nitrides; Titanium Tetrachloride. The bibliography covers intensively German World War II developments as well as latest U. S. Government-sponsored titanium research. Code No. of Report, SB-20, 20 pages, Mimeo $.50. Order from OTS. See Instructions, page 4.

ANALYSIS BY X-RAYS

A report by the Office of Naval Research includes 16 papers presented by world authorities at a conference on the applications of X-ray spectroscopy to solid state problems. (Continued on page 4.)

The OFFICE OF TECHNICAL SERVICES helps industry to avail itself of Government research, break production bottlenecks, and learn of latest shop techniques. For details see nearest Department of Commerce field office. Also available from OTS is the BIBLIOGRAPHY OF TECHNICAL REPORTS, a monthly listing with abstracts of many additional Government research reports made available to the public. Annual subscription $5.

ANALYSIS BY X-RAYS (Continued from page 3)

The X-ray spectrograph is the tool used to study how the atoms of a solid substance are tied together so that new metals, better alloys, stronger magnets, improved electrical conductors and better insulating materials may be developed. The papers in this report present the progress recently made in instruments, in experimental techniques, and in theoretical analysis in this field. Also included is a paper on how to build better vacuum pumps and another on making better geiger-counters for use in X-ray spectrometers. Code No. of Report, PB 111027. Mimeo $2.25. Order from OTS. See Instructions, below.

BETTER STORAGE BATTERY SWITCHING EQUIPMENT

The electrical characteristics of a lead storage battery during moments when it is being switched into a charging or discharging circuit may be far different from the normal (steady state) characteristics when it has been charging or discharging for some time. This presents serious problems in design of switching equipment to handle large lead storage batteries.

Scientists of the Naval Research Laboratory explored this problem. Their report describes the experimental procedure used to obtain the transient characteristics of lead storage batteries, and makes recommendations for designing switching equipment so that it will stand up under these "transient" characteristics.

PB 102174, entitled TRANSIENT ELECTRICAL CHARACTERISTICS OF LEAD-ACID SUBMARINE BATTERIES, sells for $.25 a mimeo copy. Order from OTS. See Instructions, below.

LOW-NOISE VERY HIGH FREQUENCY AMPLIFIER

More sensitive VHF receiving equipment is made possible by a new low-noise amplifier circuit developed by scientists of the Naval Research Laboratory.

Their report indicates that the new amplifier is a grounded-grid circuit based on a new commercially developed tube (416A triode) which has an exceptionally low noise level. The amplifier also has an exceptional band width. Code No. of Report, PB 111012, entitled A LOW-NOISE WIDE-BAND 20-MC INSERTION AMPLIFIER. Mimeo $.25. Order from OTS. See Instructions, below.

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Always enclose remittance and give PB number of each report.

ORDNANCE SPECIFICATIONS: SPECIFICATIONS FOR THE MANUFACTURE AND INSPECTION OF CARTRIDGE, POWDERS, AND ROCKET TANKS (ALUMINUM). U. S. Bureau of Ordnance. Jul 1944. 12p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107444

1. Tanks, Ammunition 2. Tanks, Cartridge 3. Tanks, Powder 4. Tanks, Rocket 5. NAVORD OS 675.

Paper and Allied Products

MASSA-OCH PAPPERSPROVNING, EN JÄMFÖRANDE STATISTISK ANALYS (STATISTICAL ANALYSIS OF ROUTINE TESTS FROM PAPER MILLS), by Olle Andersson. Svenska Träforskningsinstitutet. Träkemi och Papperstekniik. 1951. 10p photo, graphs (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 107456

Routine tests from three Swedish kraft paper mills have been analysed statistically. Strength properties measured by standard methods on laboratory made sheets, water-leaf sheets and machine-made paper of the same pulp have been investigated. The statistical treatment has been performed by means of punched card machines and automatic calculators and implies time series analysis, regression analysis and analysis of distributions. The time series show a decrease of the strength values in late summer, summer sickness, and a simultaneous increase in the values for rupture stretch. An approximate method has been developed to isolate the periodic component of the variations. Special attention has been paid to the relationship between strength measurements on the laboratory hand sheets and the corresponding machine paper. The correlations appear to be rather weak, which is partially due to the random fluctuations inherent in the measuring technique. A comparatively good correlation exists between strength properties of laboratory hand sheets and water-lead sheets, which justifies the use of the Valley beater in laboratory work. Reprinted from Norskskogindustri nr. 3, 1951. Summary in English. Svenska Träforskningsinstitutet. Träkemi och Papperstekniik. Meddelande 95.

STATIC ELECTRICITY IN PAPER HANDLING, by Lewis E. Walkup. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. May 1951. 17p diagr Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $3.00. PB 107626

1. Electricity, Static - Elimination 2. Paper - Electric conductivity.

Paper series no. 1.

Personnel Aptitude Testing

EXPLORATORY SURVEY OF CIVILIAN EXPERIENCE RELATED TO MILITARY JOBS, by Robert L. Thorndike and Elizabeth Hagen. U. S. Air Training Command. Human Resources Research Center, Lackland Air Force Base, San Antonio, Texas. Jun 1952. 19p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107461

This research bulletin describes development of procedures for accurate assessment of job experience. These procedures can be useful in obtaining information regarding the work experience characteristics of the manpower potential. They also have application in increasing the effectiveness of classification and assignment through providing valid indications of previous job experience which can be employed to supplement other information obtained from tests and interviews. Contract AF33(038)-13474, Project no. 510-022-0001. AAF HRRC RB 52-20.

Photographic and Optical Goods

PHOTOGRAPHIC MEASUREMENT OF ROCKET FLIGHT, by D. Barrett, I. S. Bowen, F. F. Crandell, J. B. Edson, J. B. Irwin. U. S. National Defense Research Committee. Jun 1942. 40p photos, drawing, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107773

It is shown that the photographic measurements most commonly needed in the analysis of rocket flight are: (1) the acceleration of the rocket at every point during the acceleration period; (2) the velocity of the rocket at the end of burning of the propellant; (3) the position of the rocket, with respect to the direction of aim, at various points along the trajectory; (4) the orientation of the rocket; and (5) the velocities and positions of the rocket at later points in the trajectory. The most important factor in obtaining accuracy of measurement is the maximum dimension of the photograph. The exposure time should be the minimum permissible for the light available, and the interval between exposures need not be shorter than 1/7500 sec. A camera that meets these conditions is described, and methods for orienting and locating the various cameras are outlined. Work in progress at California Institute of Technology under Contract OEMsr-250, superseded by Contract OEMsr-418. OSRD 632. NDRC A62.

SENSITIZERS FOR THE PRODUCTION, BY THE DIAZO-AMMONIA PROCESS, OF NON-PHOTOGRAPHIC BLUE-LINE DRAFTING BOARDS, by J. H. Kelly and George P. Tyson. U. S. Army Corps of Engineers. Engineer Research and Development Laboratories, Fort Belvoir, Va. May 1949. 32p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 107593

This report covers an investigation to develop a sensitizer for the production of non-photographic blue-line prints suitable for use in the drafting of map color-separation drawings. Commencing with general background, usage and the advantages of the diazo-ammonia process, the report lists the materials and equipment used, the steps in the preparation of samples, tests and results resolving from the development of the subject sensitizers. It in-

cludes the results of spectrophotometric, densitometric and photographic tests; storage qualities, shelf-life expectancy, non-photographic qualities, water resistance, color and density of the sensitizers. Summarization includes instructions for compounding sensitizer solutions and an outline of proposed future investigations. Project 8-35-09-005. Contents: Appendix A: Authority. - Appendix B, Item 1: Instructions for compounding sensitizer solutions. - Item 2: Spectrophotometric curves of samples prepared with sensitizers in various dilutions. Pages 13-15, Appendix A, is missing. ERDL R 1122.

Physics

General

NUMERICAL METHOD OF CHARACTERISTICS FOR HYPERBOLIC PROBLEMS IN THREE INDEPENDENT VARIABLES, by C. K. Thornhill. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1948. 13p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107475

1. Hyperbolic function - Gt. Brit. 2. Mathematical equations and solutions - Gt. Brit. 3. Flow, Supersonic - Gt. Brit. 4. Flow, Three dimensional - Gt. Brit. 5. Flow, Two dimensional - Gt. Brit. 6. ARC RM 2615.

S. O. code no. 23-2615. Cover date is 1952.

STUDIES ON THE VALIDITY OF THE HYDRAULIC ANALOGY TO SUPERSONIC FLOW, PARTS I AND II, by Donald R. F. Harleman. Massachusetts Institute of Technology. Revised. Jan 1951. 143p photos, diagrs (1 fold), graphs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 107674

The primary concern of Part I of this research program is the design, construction, adjustment and calibration of a supercritical flow channel best suited for experimental investigations on the hydraulic analogy to supersonic flow. A comprehensive review of previous experimental work both on supercritical flow and on the hydraulic analogy was prepared in order that the design of the channel might benefit from past experience. The construction features of the channel are described in detail. The instrumentation of the channel together with a description of the method of setting up initial flow conditions is also discussed. It is concluded that the operation of the channel after adjustment and calibration conformed to the original specifications and that it constitutes a useful research facility. Contract no. W33-038-ac-16703. AAF TR 5985, Revised.

Nuclear

ADSORPTION ON IRRADIATED GRAPHITE, by L.E.J. Roberts. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Apr 1952. 9p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107648

The absorption of argon at temperatures of -116°C, -139°C and 196°C, and the chemisorption of oxygen at 0°C, on irradiated and nonirradiated samples of the same graphite dust have been measured and compared. No large effect due to irradiation was observed. The dust was irradiated in vacuo in the N.R.X. pile to a total dose equivalent to 4.10^{19}n/sq. cm. in B.E.P.O. HD. 713. S. O. code no. 70-674-0-78. AERE C/M 144.

AERIAL PROSPECTING FOR RADIO ACTIVE MATERIALS, by E. A. Godby, S.H.G. Connock, J. F. Steljes, G. Cowper, A. Carmichael. National Research Council of Canada. Division of Mechanical Engineering. Flight Research Section and Atomic Energy Project, Chalk River, Ontario, Canada. Mar 1952. 93p photos, drawing, maps, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. Available for exchange from Division of Mechanical Engineering, National Research Council, Montreal Road, Ottawa, Canada. PB 107522

Aircraft have been used in Canada for prospecting for radioactive ores since the summer of 1948 when a Norseman aircraft was fitted with a small airborne geiger counter and was flown briefly over pitchblende deposits in Northern Saskatchewan. During 1949 and 1950, ion-chambers, improved geiger counters employing an anti-coincidence arrange, and scintillation counters were used in practical aerial surveys. Tests were made over standard radium and ore sources and over natural pitchblende deposits in Northern Saskatchewan and the Northwest Territories. In a period of two years the optimum survey height was raised from 200 feet using ordinary geiger counters or ion-chambers to 550 feet using modern scintillation counters. NRCC NR 17. NRCC AEP CRR 495.

CHARACTERISATION OF IMPURITIES IN BORON TRIFLUORIDE BY INFRA-RED ABSORPTION SPECTRA, AN A.E.R.E. MEMORANDUM, by J. Gaunt. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 5p graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107647

1. Infrared absorption - Gt. Brit. 2. Atomic power - Research - Gt. Brit. 3. Boron fluoride - Infrared absorption - Gt. Brit. 4. Spectra, Infrared - Gt. Brit. 5. AERE M C/M 124.

S. O. code no. 70-674-0-50.

DETERMINATION OF OXYGEN IN URANIUM OXIDES, AN A.E.R.E. REPORT, by L.E.J. Roberts and E. A. Harper. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. May 1952. 6p drawing, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107650

The oxygen in excess of the composition $UO_{2.000}$ in a higher uranium oxide can be measured by reducing to $UO_{2.000}$ with hydrogen or carbon mono-

xide and measuring the water or carbon dioxide formed. The accuracy of the method describes is ±3% on the excess oxygen. Possible ways of improving the accuracy and the limitations of the accuracy of the method due to chemisorption of hydrogen are discussed. HD 682. S. O. code no. 70-674-0-71. AERE C/R 885.

EFFECT OF SURFACE TREATMENT ON ELECTRIC BREAKDOWN BETWEEN COPPER ELECTRODES AT 50 CYCLES AT VERY LOW PRESSURES, AN A.E.R.E. MEMORANDUM, by R. J. B. Hadden. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1951. 14p drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.60. PB 107656

This memorandum describes the preparation of pure copper electrodes prior to electric breakdown measurements at 50 cycles/second at very low pressures. An account of the electrical measurements and the results obtained is also included. S. O. code no. 70-674-0-45. AERE G/M 92.

ELECTROMAGNETIC RESONATORS FOR TESTING THE DIELECTRIC CONSTANT AND DIELECTRIC POWER FACTOR OF DISCS OF TITANIA CERAMIC AT ABOUT 3,000 MC/S, AN A.E.R.E. REPORT by J. H. Adlam. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Nov 1951. 17p diagrs, drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107660

Two similar resonators are described. One is used to test plane ceramic discs 1.85 in. dia. x .066 in. thick, which were originally made to be tested in a resonator at X-band frequencies. The other resonator is used to test the discs for a linear accelerator. These discs have a circular hole in the centre, the size of disc being 2.373 in. outside diameter x .768 in. hole diameter x .150 in. thick. A method employing a frequency modulated Klystron was used to measure the Q-factors of the modes in these resonators. HD. 594. S. O. code no. 70-674-0-60. AERE G/R 810.

EQUILIBRIUM CONSTANT FOR THE DYSPROSIUM - T.T.A. - BENZENE SYSTEM, AN A.E.R.E. REPORT, by F. W. Cornish. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1952. 4p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107651

A value of 3.6×10^{-8} has been obtained for the equilibrium constant of the Dy — T.T.A. — benzene system. The method used is described. HD 669. S. O. code no. 70-674-0-89. AERE C/R 891.

HARWELL: THE BRITISH ATOMIC ENERGY RESEARCH ESTABLISHMENT, 1946-1951. Gt. Brit. Ministry of Supply and Gt. Brit. Central Office of Information. 1952. 157p photos, drawings, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 107377

1. Atomic power - Research - Gt. Brit. 2. Atomic power plants - Gt. Brit.

Contents: Appendix A: Senior staff of the Atomic Energy Research Establishment. - Appendix B: The Harwell reactors. - Appendix C: Scientific papers by A.E.R.E. staff. - Appendix D: Reading list and glossary.

IDENTIFICATION OF (γ,PA) REACTIONS IN NUCLEAR EMULSIONS, by M. J. Brinkworth, F. K. Goward and J. J. Wilkins. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Apr 1952. 6p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107658

The extent to which the reactions $^{12}C(\gamma, p\,d)^{7}Li$, $^{14}N(\gamma, p\,d)^{9}Be$ and $^{16}O(\gamma, p\,\alpha)^{11}B$ may account for certain three-pronged stars observed in nuclear emulsions is discussed. It is suggested that the first reaction accounts for at least 10 of the 97 stars considered but evidence for the other two reactions is inconclusive. The uncertainty arises from two causes: - Firstly it is not possible to allocate a star definitely to one or other of the above three reactions; if probable errors in measurement are allowed for, allocation can be made only on a statistical basis. Secondly, since an alpha particle of energy less than about 0.3 MeV. cannot be detected in a nuclear emulsion, it is possible to confuse the reactions with the four-particle reactions with the four-particle reactions $^{14}N(\gamma, d3\alpha)$ and $^{14}N(\gamma\ np3\alpha)$. H.13,360. AERE G/M 130.

INFRA-RED TRANSMISSION OF SOME HF RESISTANT MATERIALS, AN A.E.R.E. MEMORANDUM, by J. Gaunt. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1951. 4p drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107646

1. Infrared absorption - Gt. Brit. 2. Materials, High frequency resistant - Gt. Brit. 3. Insulators, High frequency - Gt. Brit. 4. Phosphate glass - High frequency resistance - Gt. Brit. 5. Sapphires, Synthetic - High frequency resistance - Gt. Brit. 6. Spinels, Synthetic - High frequency resistance - Gt. Brit. 7. Teflon - High frequency resistance - Gt. Brit. 8. Atomic power - Research - Gt. Brit. 9. Fluorothene - High frequency resistance - Gt. Brit. 10. Spectra, Infrared - Gt. Brit. 11. AERE C/M 120.

S. O. code no. 70-674-0-49.

METHOD OF CALCULATING THE CRITICAL DIMENSIONS OF SPHERICALLY SYMMETRICAL REACTORS II: SYSTEMS WITH A FINITE TAMPER, AN A.E.R.E. REPORT, by H. M. Melvin. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1950. 20p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 107666

The method described in the first report of this series (A.E.R.E. T/R. 586) is here adapted to the calculation of the critical dimensions of a homogeneous sphere of fissile material embedded in a homogeneous concentric spherical tamper of finite dimensions. Revised version of A.E.R.E. T/R 171. HD. 415. S. O. code no. 70-674-0-6. AERE T/R 587. AERE T/R 171, revised.

NEW DESIGN OF FILTER FOR DRY-BOXES, TYPE D/47, by W. G. Busbridge. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 5p photos, drawing Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107661

The memorandum describes a small filter for interposition between dry-boxes and the suction pump which is used to ensure that external leakage does not occur, so that suction lines and pumps do not become contaminated. The filter has three components in series which are designed to ensure the maximum service life consistent with high efficiency filtration. H. 13,354. S. O. code no. 70-674-0-76. AERE HP/M 34.

RADIOACTIVE ISOTOPES IN MINERAL DRESSING RESEARCH, AN A.E.R.E. REPORT, by J. S. Carr. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. May 1952. 32p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 107653

The function of mineral dressing and the part played by radioactive isotopes in related research is briefly introduced. Certain aspects of radioactivity, namely detection and general features of the use of radioactive isotopes pertinent to the applications considered, are discussed. The applications of radioactive isotopes to flotation research studies are considered in terms of adsorption phenomena at gas-liquid and solid-liquid interfaces. The equilibria existing at the mineral-liquid interface are discussed in order of increasing complexity, starting with a mineral in water and finishing with a mineral in a solution containing collector and other ions either activating or depressing. The experimental techniques relating to these studies which are discussed include preparation of the minerals used, equilibration procedures adopted and radiochemical measurements required. Other applications in the field of mineral dressing which are considered, concern studies of minerals per se, comminution, mechanical concentration and of fuel technology. Appendix A: Radioactive isotope production in the pile. - Appendix B: Radioactive isotope suitable for mineral dressing investigations (arranged in order of increasing half-life). Appendix C: Some radioactive compound for mineral dressing search. HD 676. S. O. code no. 70-674-0-70. AERE CE/R 912.

RELATION BETWEEN ELECTRON CURRENT AND FORWARD TARGET RADIATION INTENSITY IN HIGH ENERGY ELECTRON ACCELERATORS, AN A.E.R.E. REPORT, by J. D. Lawson. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 9p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 107659

An expression is derived for the forward radiation intensity per unit solid angle from a high energy electron accelerator in terms of the target thickness and electron energy. This expression is valid for energies above about 6 Mev. and target thicknesses of less than 0.1 radiation length. It is shown however that a reasonable estimate (to within about 15%) can be made quite easily for considerably thicker targets over quite a wide range of energy and of target materials. A measurement of the forward radiation from a linear accelerator operating at 7.3 Mev. was made and found to be in satisfactory agreement with theory. HD. 564. S. O. code no. 70-674-0-59. AERE G/R 786.

A ROCKING AUTOCLAVE FOR THE EXTRACTION OF PHOSPHORUS 32 FROM PILE-IRRADIATED SULPHUR AT THE CURIE LEVEL OF ACTIVITY, AN A.E.R.E. REPORT, by W. J. Arrol. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Nov 1951. 7p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107663

1. Autoclaves, Rocking - Gt. Brit. 2. Phosphorus - Separation from sulphur - Gt. Brit. 3. Phosphorus, Radioactive - Separation from radioactive sulphur - Gt. Brit. 4. Sulphur - Phosphorus separation - Gt. Brit. 5. Sulphur, Radioactive - Radioactive phosphorus separation - Gt. Brit. 6. Atomic power - Research - Gt. Brit. 7. AERE I/R 822.

HD. 610. S. O. code no. 70-674-0-61.

A SEMICIRCULAR WAVEGUIDE LOADED BY A SEMICIRCULAR SLOTTED SHEET, AN A.E.R.E. MEMORANDUM, by J. S. Bell and J. M. Bruce. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1952. 8p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107665

An approximate theory for the structure is presented. When the dimensions are suitably chosen no wave other than the fundamental propagates in the frequency band of the latter. However, for a certain frequency band this fundamental wave can have either of two phase velocities for a given frequency, one of the phase velocities being associated with a negative group velocity. The frequency band referred to is in the region of the slowest waves and constitutes a difficulty in the use of the device for such waves. H. 13,031. S. O. code no. 70-674-0-67. AERE T/M 57.

STATISTICAL SIGNIFICANCE OF COUNTS DIFFERING ONLY SLIGHTLY FROM THE MEAN BACKGROUND LEVEL, A.E.R.E. REPORT, by D. J. Behrens. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1951. 7p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107667

It is shown that, when an activity gives rise to a count differing only slightly from the mean background, the statistical mean activity may be well above the excess of the count over the background. Quantitative tables are included. Revised version of T/R 359. S. O. code no. 70-674-0-17. AERE T/R 640. AERE T/R 359, revised.

SURVEY OF PILE-MADE ISOTOPES FOR INDUSTRIAL RADIOGRAPHY, AN A.E.R.E. REPORT, by W. S. Eastwood. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1949. 13p drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 107662

1. Gamma rays - Industrial application - Gt. Brit. 2. Gamma rays, Artificial - Production from radioisotopes - Gt. Brit. 3. Radioisotopes - Production - Gt. Brit. 4. Radiography, Industrial - Gt. Brit. 5. Atomic power - Research - Gt. Brit. 6. AERE I/R386.

2nd issue. Cover date Dec 1949. H.D. 115. S. O. code no. 70-674-0-1.

T.P.A. IONIZATION CHAMBER MK IV, AN A.E.R.E. REPORT, by F. Wade. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 7p drawing, graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 107655

The T.P.A. Mk. IV ionisation chamber is designed to have a thin walled aluminium tube passing through the centre of the chamber along the major axis. The active material to be monitored is inserted into the aluminium tube. This ionisation chamber is designed to use the maximum number of components used in the manufacture of standard T.P.A. ionisation chambers which have been made in quantity. HD 572. S. O. code no. 70-674-0-56. AERE EL/R 807.

T.P.A. MK. II IONISATION CHAMBER, AN A.E.R.E. REPORT, by J. Sharpe and F. Wade. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 6p drawing, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 107654

By using the maximum number of standard T.P.A. ionisation chamber components and suitably modifying the design, a chamber with a re-entrant thimble can be made without introducing complicated techniques. This chamber can be filled with gas pressures up to 20 atmospheres. HD 575. S. O. code no. 70-674-0-55. AERE EL/R 806.

THE ^{12}C (γ, 3a) and ^{16}O (γ,4a) REACTIONS AT GAMMA-RAY ENERGIES UP TO 40 MEV, by F. K. Goward and J. J. Wilkins. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1951. 3p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 107657

1. Carbon - Gamma reactions - Gt. Brit. 2. Gamma rays - Energy - Gt. Brit. 3. Oxygen - Gamma reactions - Gt. Brit. 4. Synchroton beams - Gt. Brit. 5. Atomic power - Research - Gt. Brit. 6. AERE G/M 100.

Physiology

PHYSIOLOGICAL DAY-NIGHT CYCLE IN GLOBAL FLIGHTS, by Hubertus Strughold. U. S. Air Force. School of Aviation Medicine. Randolph Field, Texas. Oct 1952. 12p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107670

The physiological diumal cycle, synchronized with the physical or astronomical periodicity of day and night, is discussed. The persistence of the physiological cycle is emphasized. This persistence leads to a phase shift in the physical and physiological day-night cycle following long-distance flights in east-west or west-east directions. The implications of this phase shift during the incomplete cycle adaptation of the first few days, as it affects the individual's physical and mental efficiency, is discussed at some length. AAF SAM Project report.

Printing, Publishing, and Allied Industries

CONTROL OF WARP IN BOOK COVERS, by Morris S. Kantrowitz and Frederick R. Blaylock. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 7p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.10. PB 107623

1. Books - Covers - Warping 2. Sizing agents - Tests 3. Sizing, Warp.

GPO-PIA joint research bulletin, bindery series no. 8.

DETERGENTS FOR THE PRINTER, by Morris S. Kantrowitz and Earl J. Gosnell. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 7p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.10. PB 107624

1. Detergents - Uses 2. Solvents - Use in printing industry 3. Cleansing agents, Alkaline 4. Wetting agents.

GPO-PIA joint research bulletin, materials series no. 1.

ENGINEERING TESTS OF EXPERIMENTAL AMMONIA PROCESS PRINTER-DEVELOPER, by John H. Kelly. U. S. Army. Corps of Engineers. Engineer Research and Development Laboratories, Fort Belvoir, Va. Jul 1950. 65p photos, map, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107594

1. Ammonia process 2. Photographic prints - Reproduction 3. Developers (Photography) - Tests 4. Chemicals, Photographic 5. ERDL R 1174.

Project 8-35-09-005. Contents: Appendix A: Not included. - Appendix B: Definition of terms used in connection with the ammonia process. - Appendix C: Description of the ammonia process and comparison with the silver halide process. - Appendix D: Test data and drawings. - Appendix E: Information required for standardization. Approved of Report 1174, Final Report, engineering tests of experimental ammonia process printer-developer, 6 July 1950.

GENERAL SPECIFICATIONS FOR OPERATING INSTRUCTION MANUALS, PARTS CATALOGS, LUBRICATION CHARTS AND ERECTION MANUALS RELATING TO EQUIPMENT SUPPLIED TO THE GRAPHIC ARTS INDUSTRY. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. Sep 1950. 23p drawings Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $1.00. PB 107627

1. Printing equipment - Manuals - Specifications.

Equipment series no. 1.

MISCELLANEOUS BOOKBINDING ADHESIVES, by Morris S. Kantrowitz and George G. Groome. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 9p Available from Printing Industry of America, 719 15th St., N. W., Washington, D. C. $.15. PB 107619

1. Bookbinding - Adhesives.

GPO-PIA joint research bulletin, bindery series no. 4.

PHOTOENGRAVING SPECIFICATIONS MANUAL FOR LETTERPRESS PRINTING FROM ELECTROTYPES, MAGAZINE, CATALOG AND COMMERCIAL WORK. Printing Industry of America, Inc., Washington, D. C. Sep 1950. 31p col. photos, drawings Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.50. PB 107625

1. Photoengraving - Specifications.

PREVENTIVE MAINTENANCE, by Lillian Stemp. Research and Engineering Council of the Graphic Arts Industry, Inc., Washington, D. C. 1950. 36p drawings Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D.C. $3.00. PB 107628

1. Printing equipment - Maintenance and repair 2. Printing Industry - Safety precautions.

Equipment series no. 2.

PROCESS OF MARBLING PAPER, by Morris S. Kantrowitz and Ernest W. Spencer. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 12p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107616

1. Hunter, Dard. Bibliography of marbled paper 2. Paper - Marbling 3. Paper - Marbling - Bibliography.

GPO-PIA joint research bulletin, bindery series no. 1. Includes Bibliography of marbled paper, by Dard Hunter, reprinted from Paper trade journal, Apr 28, 1921.

PROVINCIAL PRESS. REPORT OF A PRODUCTIVITY TEAM REPRESENTING THE BRITISH PROVINCIAL PRESS WHICH VISITED THE UNITED STATES OF AMERICA IN 1951. Anglo-American Council on Productivity. Sep 1952. 106p photos, graphs, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.90. PB 106460

1. Newspaper industry.

REPRODUCTION PROOFS, by O. F. Duensing. U. S. Government Printing Office and Printing Industry of America, Inc. 1949. 12p Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $2.50. PB 107613

1. Films (Photography) - Copying 2. Photographic copying.

GPO-PIA joint research bulletin, composition series no. 2.

Psychology

DAYLIGHT PROJECTION OF FILM LOOPS AS THE TEACHING MEDIUM IN PERCEPTUAL-MOTOR SKILL TRAINING, by J. A. Murnin, W. Hayes, S. F. Harby. Pennsylvania State College, State College, Pa. May 1952. 10p table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 111067

1. Motion pictures, Educational 2. Teaching methods 3. SDC TR 269-7-26.

Contract N6onr-269. Human Engineering Project 20-E-4.

FILM PROFILES (RAPID MASS LEARNING), by Loran Twyford. Pennsylvania State College, State College, Pa. Nov 1951. 19p graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111065

1. Motion pictures, Educational 2. SDC TR 269-7-23.

Contract N6 onr-269, T. O. VII, Project NR-781-005. SDC Human Engineering Project 20-E-4.

PIGEON PROJECT. FINAL REPORT 15 JUN 1949-15 JUN 1952 UNDER CONTRACT N5ORI-07631, by B. F. Skinner and C. B. Ferster. Harvard University. Psychological Laboratories. Jun 1952. 18p graphs Available from Library of Congress, Publication Board, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107724

1. Pigeons - Response to stimuli 2. Psychological tests.

RELATIONSHIP OF ANXIETY TO LEARNING FROM FILMS, by Sarah G. Allison and Philip Ash. Pennsylvania State College, State College, Pa. Apr 1951. 17p diagr, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111066

1. Motion pictures, Educational 2. Psychology, Applied 3. Anxiety 4. SDC TR 269-7-24.

Contract N6 onr-269, T. O. VII, Project NR-781-005. SDC Human Engineering Project 20-E-4.

USE OF AUTOCORRELATION FUNCTIONS IN THE HARMONIC ANALYSIS OF HUMAN BEHAVIOR, by R. Narasimban and Otis J. Benepe. Indiana. University, Bloomington, Ind. Oct 1951. 13p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107586

The tenability and possibilities of haromine analysis of continuous human behavior are discussed. The Wiener method of analysis is presented. The autocorrelation and spectral density functions are analytically defined. Approximations to them necessary for their practical application are presented. The limitations and assumptions of the method as applied to practical problems are discussed. Research prob-

lems concerned with these limitations and assumptions are pointed out. Contract no. W33-038-ac-13968. AAF TR 6529.

VALUE OF NOTE-TAKING DURING FILM LEARNING (RAPID MASS LEARNING), by Philip Ash and Bruce J. Carlton. Pennsylvania State College, State College, Pa. Nov 1951. 12p diagr, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111064

1. Motion pictures, Educational 2. Teaching methods 3. SDC TR 269-7-21.

Contract N6onr-269, T. O. VII, Project NR-781-005. SDC Human Engineering Project 20-E-4.

Rubber and Rubber Products

STUDY OF GR-S FACEBLANK COMPOUNDS, by H. A. Winkelmann, and M. P. Marks. Sheller Manufacturing Corporation. Dryden Rubber Division, Chicago, Ill. n.d. 70p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 107310

1. Rubber, Synthetic - Polymerization 2. Rubber, Buna - Polymerization 3. Polymers, Low temperature 4. Buna S (Trade name) 5. M9-Al (Face mask) 6. Face - Protection 7. Masks, Face - Rubber, Synthetic 8. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md.

Structural Engineering

STORM PROTECTION LABORATORY FOR TESTING BUILDING COMPONENTS AND OTHER MATERIALS UNDER HURRICANE CONDITIONS, by Vincent G. Polovkas and Robert A. Thompson, Department of Aeronautical Engineering. Florida. Engineering and Industrial Experiment Station, Gainesville, Fla. Sep 1952. 13p photos Available from The Director, Florida Engineering and Industrial Experiment Station, Gainesville, Florida. PB 107643

1. Storms, Tropical - Protection 2. Buildings - Tropics - Storm protection 3. Building materials - Storm protection 4. Hurricanes - Protection 5. F EES B 56.

Bulletin series no. 56. Engineering progress at the University of Florida, Vol. VI, no. 9, September 1952.

USE AND INTERPRETATION OF THE NRL EXPLOSION BULGE TEST, by W. S. Pellini. U. S. Naval Research Laboratory. Sep 1952. 30p photos, drawings, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111060

A method has been developed for the investigation of structural performance of weldments on a model scale. The method entails bulging plates in diaphragm fashion by means of explosion gas pressure. Two types of tests are performed by means of this method; (1) Tests of plates which contain a synthetic cleavage crack, aimed at determining the brittle fracture characteristics of the base plates; (2) Tests of weldments, aimed at determining the relative resistance to the initiation of failure and the possible development of brittle fractures in either the weld or the heat-affected-zone. Details of the use of the test method and of the significance of the findings are presented in simplified form for general information. NRL R 4034.

Textiles and Textile Products

NOTES ON FABRICS AND TREATMENTS FOR PAULINS AND TENTAGE USED BY THE CANADIAN ARMED SERVICES AS COVERED IN SPECIFICATIONS OF THE CANADIAN GOVERNMENT SPECIFICATIONS BOARD, by C. H. Bayley. National Research Council of Canada. Division of Applied Chemistry. Jul 1952. 9p Available from National Research Council of Canada, Ottawa, Canada. $.25. PB 107525

The purpose of these notes is to discuss the properties of the base fabrics and finished ducks used in the manufacture of paulins, including covers for motor transport vehicles, and also the various current treatments which can be employed to give the required properties. NRCC 2808.

PYROXYLIN-TREATED BOOK CLOTHS, by Morris S. Kantrowitz, George G. Groome, and Frederick R. Blaylock. U. S. Government Printing Office and Printing Industry of America, Inc. 1948. 14p tables Available from Printing Industry of America, Inc., 719 15th St., N. W., Washington, D. C. $.15. PB 107622

1. Fabrics, Impregnated - Tests 2. Fabrics, Cotton - Pyroxylin-impregnated - Specification 3. Bookbinding - Materials.

GPO-PIA joint research bulletin, bindery series no. 7.

Transportation Equipment

Aeronautics

Aircraft

EFFECTS OF RATE AND DURATION OF LOADING ON THE STRENGTH OF AIRCRAFT STRUCTURES, by K. D. Raithby. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1939. 13p photos, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107493

The effects of rate and duration of loading on the structural strength of aircraft have been investigated by comparing the failing loads of both wooden and metal tailplanes when tested at different rates of loading, the duration of test varying from about 6 seconds to 3 3/4 hours. With wooden structures,

differences in strength due to rate of loading were much less than those predicted from the results of American tests on wood. With metal structures neither rate of loading nor sustained high loading had any appreciable effect on the failing load. Cover date is 1952. S. O. code no. 23-2736. ARC RM 2736.

EMPIRICAL FORMULA FOR THE ULTIMATE SHEAR STRENGTH OF WING LEADING EDGES, by F. Turner. Svenska Aeroplan Aktiebolaget, Linköping, Sweden. 1952. 22p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107755

This report gives an empirical formula for the ultimate shear strength of wing leading edges of 24 ST Alclad, reinforced by conventional ribs, and chordwise or spanwise stiffeners. It covers a wide range of the design parameters, including both newer and older wing types. The formula has been checked by a large number of structural tests, the results of which are given in the report. In the Appendix a brief comparison with the findings of NACA Technical Note 2362 is also given. SAAB TN5.

ETUDE THEORIQUE DU SHIMMY DES ROUES D'AVION (ANALYTICAL STUDY OF SHIMMY OF AIRPLANE WHEELS). Bourcier de Carbon, Christian. Sep 1952. 126p photos, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107459

The problem of shimmy of a castering wheel, such as the nose wheel of a tricycle gear airplane, is treated analytically. The flexibility of the tire is considered to be the primary cause of shimmy. The rather simple theory developed agrees rather well with previous experimental results. The author suggests that shimmy may be eliminated through a suitable choice of landing gear dimensions in lieu of a damper. Translation of France. Office of National d' Etudes et de Recherches Aeronautiques. Publication no. 7, 1948. NACA TM 1337.

FLAT TRIANGULAR WING WITH SUBSONIC LEADING EDGES IN STEADY PITCH AND ROLL AT SUPERSONIC VELOCITIES, by Herman Behrbohm. Svenska Aeroplan Aktiebolaget, Linköping, Sweden. Mar 1952. 22p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107757

Theoretical investigations of certain shapes of supersonic wings require the knowledge of the upwash in front of a triangular wing with supersonic leading edges. Such a determination of the upwash is given here. Former results for the case of constant angle of incidence are generalized to the case of the uniformly pitching and the uniformly rolling triangular flat plate. Linearized theory is used, working with distributions of supersonic source-singularities along the rays through the apex of the wing. Satisfying the boundary conditions leads to the singular integral equation of classical airfoil theory for a certain well-defined function of the upwash. The upwash itself is then obtained as the solution of Volterra's integral equation of the second kind. SAAB TN 9.

FLIGHT INVESTIGATION OF THE EFFECT OF SHAPE AND THICKNESS OF THE BOUNDARY LAYER ON THE PRESSURE DISTRIBUTION IN THE PRESENCE OF SHOCK, by Eziaslav N. Harrin. U. S. National Advisory Committee for Aeronautics. Sep 1952. 13p photos Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107519

An investigation was made in flight at free-stream Mach numbers up to about 0.77 to determine the effect of a laminar boundary layer and thin and thick turbulent boundary layers on the chordwise pressure distribution over an airfoil in the presence of shock at full-scale Reynolds numbers. Boundary-layer and pressure-distribution measurements were made on a short-span airfoil built around a wing of a fighter airplane. Boundary-layer Reynolds numbers (based on momentum thickness and flow parameters at the outer edge of the boundary layer) were about 3,000 for the laminar boundary layer and 10,000 for the thickest turbulent boundary layer with local Mach numbers ranging up to 1.3 and chord Reynolds numbers up to about 21×10^6. NACA TN 2765.

FLIGHT INVESTIGATION OF TRANSIENT WING RESPONSE ON A FOUR-ENGINE BOMBER AIRPLANE IN ROUGH AIR WITH RESPECT TO CENTER-OF-GRAVITY ACCELERATIONS, by Harry C. Mickleboro, Richard B. Fahrer and C. C. Shufflebarger. U. S. National Advisory Committee for Aeronautics. Sep 1952. 25p diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107521

The results of a flight investigation on a four-engine bomber airplane to determine the transient-response effects of wing flexibility in gusts showed that the measured acceleration increments at the center of gravity were approximately 28 percent higher than the true airplane acceleration increments. This relationship appeared to be only slightly affected by the variations in speed and weight covered by the test conditions. NACA TN 2780.

FLOW STUDIES IN THE VICINITY OF A MODIFIED FLAT-PLATE RECTANGULAR WING OF ASPECT RATIO 0.25, by William H. Michael, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1952. 33p photos, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107634

Studies were made of the flow in the vicinity of a modified flat-plate rectangular wing of aspect ratio 0.25 by the use of photographs of a tuft grid located at various chordwise positions on the wing and behind the wing, supplemented by wake studies with a yaw-head pitot-tube installation. Evaluations were made concerning the rolling-up of the trailing vorticity, vorticity distribution in the wake, chordwise growth of lift, and locations of the vortex cores. NACA TN 2790.

INTERFERENCE FIELDS ABOUT AIRCRAFT. LIGHTNING & TRANSIENTS RESEARCH INSTITUTE, MINNEAPOLIS, MINN. INTERIM ENGINEERING REPORT 183-3 FOR PERIOD JUNE 8-SEP 8, 1952 UNDER CONTRACT AF18 (600)-183. Sep 1952. 29p

photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 107709

The purpose of this investigation is to determine the magnitude and pattern of electromagnetic fields external to the skin of an all metal aircraft which result from circulating radio interference currents in the aircraft skin and interior wiring in the frequency range of 400 mc to 33,000 mc. The investigation is further directed towards establishing the fuselage signal reduction factor resulting from openings in the aircraft skin, and the effects of the physical properties and dimensions of the aircraft on the external electromagnetic fields. For 2d interim report see PB 107515; for final report Jan 1951-Jan 1952 see PB 107578. LTRL T 225.

LANDING-GEAR IMPACT, by W. Flügge. U. S. National Advisory Committee for Aeronautics. Oct 1952. 91p diagr, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107686

The report deals with the impact forces in landing gears. Both the landing impact and the taxying impact have been considered, but drag forces have so far been excluded. The differential equations are developed and their numerical integration is shown, considering the nonlinear properties of the oleo shock strut. A way is shown for determining the dimensions of the metering pin from a given load-time diagram. A review of German literature on landing-gear impact is also presented. Bibliography of German literature, p. 74-75. NACA TN 2743.

NOTE ON THE APPLICATION OF THWAITES NUMERICAL METHOD FOR THE DESIGN OF CAMBERED AEROFOILS, by A. R. Curtis. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1949. 13p diagr, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107490

Some minor developments in the technique of Thwaites' Numerical Method of Aerofoil Design are described. In particular, the process of obtaining the camber-line ordinates from the Goldstein Approximation I velocity distribution is discussed in detail; the relevant tables of constants are given. An opportunity is taken to include a complete set of 20-point tables of Conjugation Factors needed in any actual application of the Numerical Methods. Cover date is 1952. S. O. code no. 23-2665. ARC RM 2665.

PLANING CHARACTERISTICS OF A SURFACE HAVING A BASIC ANGLE OF DEAD RISE OF 20° AND HORIZONTAL CHINE FLARE, by Walter J. Kapryan and Irving Weinstein. U. S. National Advisory Committee for Aeronautics. Oct 1952. 42p photos, drawing, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107688

A high-speed investigation was conducted to determine the hydrodynamic characteristics of a planing surface having an angle of dead rise of 20° and horizontal chine flare. NACA TN 2804.

PRESSURE AND BOUNDARY LAYER MEASUREMENTS ON A 59° SWEPTBACK WING AT LOW SPEED AND COMPARISON WITH HIGH SPEED RESULTS ON A 45° SWEPT WING. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1949-1950. 59p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.80. PB 107428

The low speed pressure distribution has been measured over a range of incidence on a 59° swept wing of symmetrical section t/c 14%, aspect ratio 3.61, taper ratio 4 to 1. These results have been compared, using the liner perturbation theory, with those on a 45° swept wing aspect ratio 5.87 at M=0.8. There is fairly good agreement at zero incidence but lift distribution does not appear to be predicted so well. The results on the 59° wing show clearly the large effects of sweepback on both the pressure distribution at zero incidence and the lift distribution near the centre section of the wing. Comparisons with theoretical estimates at zero incidence show good agreement. Report no. Aero. 2311, Feb 1949. Report no. Aero. 2311a, Aug 1950. C. P. no. 86. Contents: Part I: By the Tunnel Staff of Aero Department, R.A.E. Feb 1949. Part II: (Continuation of Aero Report 2311), by G. G. Brebner. - Appendix: Determination of static pressure, dynamic pressure, velocity and total head by the Conrad yawmeter. Cover date is 1952. S. O. code no. 23-9006-86. ARC CP 86.

PRESSURE DISTRIBUTIONS AT HIGH SPEED ON EC 1250 (DATA REPORT), by J. A. Beavan and G.A.M. Hyde. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1947. 12p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107487

This report puts on record, as data, pressure distributions measured on a 5-in. chord aerofoil of EC 1250 section in the 20 x 8 in. Rectangular High-Speed Tunnel, at the National Physical Laboratory. Cover date is 1952. S. O. code no. 23-2625. See also R & M 2560, R & M 2065, R & M 2222 (PB 101-435) and R & M 2056 (PB 69112). ARC RM 2625.

STABILIZING ELEMENTS IN AIRCRAFT DC SYSTEMS, by D. G. Scorgie and D. H. Schaefer. U. S. Naval Research Laboratory. Aug 1952. 25p diagrs, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.75. PB 111041

A feedback electronic circuit which directly measures the carbon pile resistance can be used to find the open loop transfer functions of a regulator-generator system. NRL R 4018.

STRUCTURAL ASPECTS OF SUCTION WINGS, by E. H. Mansfield. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1951. 26p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.15. PB 107429

This report considers the structural design problems arising directly from the use of distributed wing suction. Possible types of construction are discussed

and estimates are made of the increase in aircraft all up weight due to these constructions and due to the extra power required for suction. Report no. Structures 111. C. P. no. 87. Contents: Appendix I: Increase in skin thickness to maintain torsional and flexural stiffness in inverted stringer-sheet construction. - Appendix II: Critical suction pressures causing inner-quilting. - Appendix: III: Flow along a rough duct with a porous wall. - Appendix IV: Variable porosity to give correct suction flow. Cover date is 1952. S. O. code no. 23-9006-87. ARC CP 87.

STUDY OF THE PRESSURE RISE ACROSS SHOCK WAVES REQUIRED TO SEPARATE LAMINAR AND TURBULENT BOUNDARY LAYERS, by Coleman duP. Donaldson and Roy H. Lange. U. S. National Advisory Committee for Aeronautics. Sep 1952. 20p photos, drawing, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107457

Results are presented of a dimensional study and an experimental investigation of the pressure rise across a shock wave which causes separation of the boundary layer on a flat plate. The experimental part of the investigation was conducted at a Mach number of 3.03 for a Reynolds number range of 2×10^6 to 19×10^6. The available experimental data are compared with the predictions of the present study, and the significance of the results obtained is discussed relative to certain practical design problems. NACA TN 2770.

SUMMARY OF AVAILABLE HAIL LITERATURE AND THE EFFECT OF HAIL ON AIRCRAFT IN FLIGHT, by Robert K. Souter and Joseph B. Emerson. U. S. National Advisory Committee for Aeronautics. Sep 1952. 164p photos, maps, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107559

Available information on the hail phenomenon affecting aircraft in flight has been examined. This paper attempts to coordinate the present knowledge of hail with the effect of hail on aircraft in flight and includes (1) a digest of the literature on the physical properties, the occurrence, and the formation of hail; (2) a survey of the hail effect on aircraft in flight from analyses of 57 cases of airplanes damaged by hail; (3) a résumé of hail information for the benefit of pilots, forecasters, and ground operational personnel; and (4) an annotated hail bibliography of 552 articles for use of research personnel. NACA TN 2734.

SYSTEMATIC WIND-TUNNEL TESTS WITH SLATS ON A 10 PER CENT THICK SYMMETRICAL WING SECTION (EQ 1040 PROFILE), by G. F. Moss. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1948. 22p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 107478

It was thought that present rules for the design of Handley Page slats might be inadequate for modern high-speed aerofoil sections. These tests were made on the EQ 1040 wing section to determine the optimum slat setting for this type of wing profile. Three slats were tested whose chords were 10 per cent, 20 per cent and 30 per cent of the wing chord, over a wide range of positions. Lift coefficients were measured over the stall in each case. Some tests were made with a split flap. Best results for the 10 per cent chord slat are obtained with very small gap and large dip. Zero gap, i.e., using the slat as a nose flap, may in fact give the optimum. Optimum positions for the larger chord slats are more conventional, but require larger forward extensions than are given by the old rules. S. O. code no. 23-2705. Cover date is 1952. ARC RM 2705.

Instruments

DEVELOPMENT OF THE NRL AXIAL-FLOW VORTEX THERMOMETER, by R. E. Ruskin, R. M. Schecter, J. E. Dinger, and R. D. Merrill. U. S. Naval Research Laboratory. Sep 1952. 35p photos, drawings, diagrs (1 fold), graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111055

The temperature of the atmosphere as measured using conventional thermometers on a plane must be corrected by an amount dependent on the flight speed. The Axial-Flow Vortex Thermometer makes use of the cooling effect present at the center of a vortex to counteract the dynamic heating due to the plane's speed. The axial-flow design permits a small frontal area to be presented to the air stream for minimum air drag. The temperature at the center of the vortex formed behind the spinner vane is measured by means of a wire-wound resistance-temperature element recently developed to provide a straight line resistance-temperature function within a few hundredths of a degree over the entire range of the instrument from -60° to +60°C. A servo-balancing-type bridge and amplifier is used with a linear 10-turn potentiometer to provide automatic indication independent of variations in power voltage, frequency, and cable lengths within wide limits. The temperature indications are presented on a digital counter reading directly to 0.1°C. NRL R 4008.

Engines and Propellers

AN EXPERIMENTAL INVESTIGATION OF THE FLOW THROUGH A HELICOPTER ROTOR IN FORWARD FLIGHT, by P. Brotherhood and W. Stewart. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1949. 12p photos, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107549

Experiments have been made to determine the flow conditions through a helicopter rotor in forward flight using the smoke filament technique. This method consisted of flying the helicopter behind an aircraft from which smoke generators were suspended on a long wire. The smoke trials passed through the main rotor of the helicopter, and photographs were taken from another aircraft in a side position. Flow conditions at the rotor disc over a narrow band on the side of the advancing blade were investigated in this way. The range of speeds covered was from 44 m.p.h. to 60 m.p.h. corresponding to a range of

tip speed ratios 0.138 to 0.188. An increase in induced velocity from front to rear of the rotor disc was obtained. The results are in reasonable agreement with theoretical predictions. Cover date is 1952. S. O. code no. 23-2734. ARC RM 2734.

MEASUREMENT OF AIR FLOW THROUGH AN AIRCRAFT GENERATOR DURING FLIGHT. PART II: ANALYSIS OF FLIGHT TEST DATA FOR F7F-3 AIRCRAFT, by J. M. Marzolf and D. Friedman. U. S. Naval Research Laboratory. Sep 1952. 16p graphs, tables (1 fold) Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111069

It was found that a large portion of the available pressure drop was lost by exhausting the generator cooling air into the engine compartment, that the generator cooling air was heated in passing through the blast tube. The data further indicate that the conduction of heat through the generator shaft and mounting studs may be an important factor in determining the generator load-carrying ability. For Part I see PB 106715. NRL R 4048.

ONE-DIMENSIONAL ANALYSIS OF CHOKED-FLOW TURBINES, by Robert E. English and Richard H. Cavicchi. U. S. National Advisory Committee for Aeronautics. Oct 1952. 53p diagr, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107712

Flow conditions internal to choked-flow turbines were subjected to a one-dimensional analysis. Factor affecting the design, operation, and manufacture of such turbines were investigated. Criteria are presented which will aid in analysis of test data from such turbines. The effect of turbine-stator adjustment on internal flow conditions was investigated for one application of turbine stator adjustment. NACA TN 2810.

PARTS CATALOG: ELECTRIC PROPELLERS MODELS C644S-A AND C644S-B (CURTISS-WRIGHT) REVISED. U. S. Air Force and U. S. Bureau of Aeronautics. Apr 1952. 60p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 107190r3

Partial revision of PB 107554.

PARTS CATALOG FOR MODELS R-2800-22, -22W, -34, -34W, -57, -73, -77, -83 and -85 AIRCRAFT ENGINES. U. S. Air Force and U. S. Bureau of Aeronautics. Dec 1951. 104p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 42127r5

1. AN 02 A-10GC-4.
Supersedes AN 02-10GC-4 dated 15 Apr 1950.

Training and Training Devices

DEVELOPMENT OF A FORCED-CHOICE RATING SCALE FOR EVALUATION OF CLASSROOM INSTRUCTORS, by Francis D. Harding, Jr. and William F. Long. U. S. Air Training Command. Human Resources Research Center. Aircraft Observer Training Research Laboratory, Mather Air Force Base, Calif. Jun 1952. 14p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 107535

1. Pilots, Air - Training 2. Ability tests 3. Tests, Officer qualification 4. Instructors, Aviation - Evaluation 5. AAF HRRC RB 52-21.
Project no. 506-006-0001.

Aerodynamics

AERODYNAMIC CHARACTERISTICS OF THREE DEEP-STEP PLANING-TAIL FLYING-BOAT HULLS AND A TRANSVERSE-STEP HULL WITH EXTENDED AFTERBODY, by John M. Riebe and Rodger L. Naeseth. U. S. National Advisory Committee for Aeronautics. Aug 1952. 28p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107419

An investigation was made to determine the aerodynamic characteristics of three deep-step (92 percent of beam) planing-tail flying-boat hulls differing only in the amount of step fairing and of a transverse-step hull with extended afterbody. Minimum drag coefficients, which include the interference effects of the support wing, were 0.0066 for the transverse-step hull - about the same as for a conventional hull - and 0.0057 or 14 percent less for the hull with a deep unfaired step. The hulls with step fairing had up to 44 percent less drag. Longitudinal and lateral stability was about the same as for a conventional hull. NACA TN 2762.

AIRFOIL PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES-APPLICATION OF SHOCK-EXPANSION THEORY, INCLUDING CONSIDERATION OF HYPERSONIC RANGE, by Dean R. Chapman. U. S. National Advisory Committee for Aeronautics. Sep 1952. 44p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107560

A theoretical investigation employing shock expansion theory is made of the airfoil profile having minimum pressure drag at zero lift for various given auxiliary conditions. Curves are presented to facilitate the application of the theory, and typical optimum profiles are illustrated. A comparison of results obtained by the simpler linearized-theory method of a previous report indicates that the simpler method can be used with engineering accuracy to determine the shape, though not the drag, of the optimum profile at Mach numbers up to infinity. It is shown that considerable deviation from the optimum shape can be made without a large increase in drag except on thin airfoils at moderate supersonic Mach numbers. NACA TN 2787.

ANFACHUNG INSTABLIER STÖRUNGEN IN EINER LAMINAREN REIBUNGSSCHICHT (EXCITATION OF UNSTABLE PERTURBATIONS IN A LAMINAR FRICTION LAYER), by Joachim Pretsch. Sep 1952. 63p diagrs, graphs, tables Available from National Advi-

sory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107460

With the aid of the method of small oscillations which was used successfully in the investigation of the stability of laminar velocity distributions in the presence of two-dimensional perturbations, the excitation of the unstable perturbations for the Hartree velocity distributions occurring in plane boundary-layer flow for decreasing and increasing pressure is calculated as a supplement to a former report. The results of this investigation are to make a contribution toward calculation of the transition point on cylindrical bodies. Bericht der Aerodynamischen Versuchsanstalt Göttingen E. V. Institut für Forschungsflugbetrieb und Flugwesen. Translated from Jahrbuch der deutschen luftfahrtforschung. Aug 1942, p. 154-171. NACA TM 1343.

APPROXIMATE METHOD FOR DETERMINING THE DISPLACEMENT EFFECTS AND VISCOUS DRAG OF LAMINAR BOUNDARY LAYERS IN TWO DIMENSIONAL HYPERSONIC FLOW, by Mitchel H. Bertram. U. S. National Advisory Committee for Aeronautics. Sep 1952. 41p photos, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107520

A simplified approximate theory is presented by means of which the laminar boundary layer over an insulated two-dimensional surface may be calculated, a linear velocity profile being assumed, and an estimate made of its effect in changing the pressure distribution over the profile upon which the boundary layer is formed. Skin friction is also determined. Comparisons of results from this theory are made with experimental results at a Mach number of 6.86 and a Reynolds number of 980,000. NACA TN 2773.

BOUNDARY-LAYER AND WAKE INVESTIGATION IN SUPERSONIC FLOW, by J. Lukasiewicz and J. K. Royle. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1948. 22p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 107474

The report describes the results of traverses of the boundary-layer and wake encountered in a small supersonic tunnel at a Mach number of 2.5. The tunnel was arranged with two throats in parallel formed by two shaped walls enclosing a shaped central element. Both the laminar and turbulent boundary-layers were encountered and compared with existing experimental and theoretical results. The frictional drag of the central element as deduced from the wake traverses is in close agreement with that calculated from considerations of laminar boundary-layer growth over the surface of the element. The tests also provide information relating to the design of nozzle profiles, particularly at the point of inflexion, where the changes of pressure gradient may have a serious effect on the boundary-layer and on the velocity distribution. S. O. code no. 23-2613. Cover date is 1952. ARC RM 2613.

BRIEF SURVEY OF SOME METHODS AND INFORMATION CONCERNING THE AERODYNAMIC DERIVATIVES OF WINGS IN UNSTEADY MOTION AT TRANSONIC SUPERSONIC SPEEDS, by W.E.A. Acum. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1951. 17p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107427

1. Linear systems - Computing methods - Gt. Brit. 2. Flow, Transonic - Theory - Gt. Brit. 3. Flow, Supersonic - Theory - Gt. Brit. 4. Wings, Vibration - Calculations - Gt. Brit. 5. Wings - Aerodynamics - Gt. Brit. 6. Gt. Brit. National Physical Laboratory, Aerodynamics Division 7. ARC CP 85.

C.P. no. 85. Cover date is 1952. S. O. code no. 23-9006-85.

CALCULATION OF THE LATERAL CONTROL OF SWEPT AND UNSWEPT FLEXIBLE WINGS OF ARBITRARY STIFFNESS, by Franklin W. Diederich. U. S. National Advisory Committee for Aeronautics. 1951. 21p diagrs, graphs, tables Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 107530

Provision is made for using either stiffness curves and root-rotation constants or structural influence coefficients in the analysis. Computing forms and an illustrative example are included to facilitate calculations by means of the method. The effectiveness of conventional aileron configurations and the margin against aileron reversal are shown to be relatively low for swept wings at all speeds and for all wing plan forms at supersonic speeds. NACA Rept. 1024.

NOTES AND GRAPHS FOR BOUNDARY LAYER CALCULATIONS IN COMPRESSIBLE FLOW, by W. F. Cope. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1951. 22p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 107483

Formulae are given for calculating the skin friction coefficients and the various parameters associated with the boundary layer up to Mach numbers of 4. The calculations have been made for a laminar boundary layer with a sinusoidal velocity distribution; for a turbulent boundary layer a "power law" velocity distribution, the distribution following "one fifth", "one seventh", "one ninth"and "one eleventh" power laws; and for a turbulent boundary layer with a "log law" velocity distribution. C.P. no. 89. Cover date is 1952. S. O. code no. 23-9006-89. ARC CP 89.

SORYU-BAKURI NI TOMONAU SON'I NI KANSURU KENKYU (TRANSITION CAUSED BY THE LAMINAR FLOW SEPARATION), by T. Maekawa and S. Atsumi. Sep 1952. 14p diagrs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 107421

An experimental investigation of the effects of the geometry of body surface, Reynolds number, stream turbulence, and a roughness element (wire) on the reattachment of separated laminar boundary-layer flow on a bent flat plate is presented and discussed. The flow mechanisms determining reattachment of the boundary layer are analyzed and discussed. Translated by Itiro Tani from Journal of the Society of Applied Mechanics, Japan, vol. 1, no. 6, Nov 1948, p. 187-192. NACA TM 1352.

Patents

Miscellaneous

GERMAN PATENT APPLICATIONS IN INSTRUMENTS AND VARIOUS OTHER FIELDS. Reichspatentamt, Berlin. 1940-1945. 957f Microfilm $9.00, Enlargement print $125.00 PB 84473

This reel, prepared by FIAT investigators in Germany, contains 129 applications of different classes. Individual items are listed below and will be available as enlargement prints. The entire reel may be purchased as a microfilm for $9.00. Please include PB and frame numbers when ordering individual items. FIAT Microfilm Reel B 49, Frames 1-957.

Frames	Title	Price
1-3	Glass-body for optical use. Sicherheitsglas G.m.b.H., Kunzendorf, N./L. Ger. patent application dated 1943.	$1.50
4-8	Device for measuring or comparing minute forces or torques. Siemens & Halske A. G., Berlin. Ger. patent application S 157712, dated 1943.	$1.50
9-15	Contact-extensometer. Ger. patent application S 157756, dated 1943.	$2.50
16-17	Window resistant to pressure. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application dated 1943.	$1.50
18-21	Device for measuring or tracing lengths. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 156481, dated 1943.	$1.50
22-26	Protecting device for watermeters. Skumburdis, K. (Inventor). Ger. patent application for patent of addition S 156428, dated 1943.	$1.50
27-34	Device for measuring fixed quantities of a liquid and of the reagent liquid necessary for its analysis. Sattler, W. (Inventor). Ger. patent application S 157349 IXb/42 C, dated 1943.	$2.50
35-39	Process and device for sorting small metal parts according to size. Siebel-Flugzeugwerke G.m.b.H., Halle/Saale. Ger. patent application dated 1943.	$1.50
40-44	Position finding instrument for infrared projectors. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 155969 IXb/42c, dated 1943.	$1.50
45-51	Measuring device for determining oxygen content, using a magnetic system. Siemens & Halske A. G., Berlin. Ger. patent application S 155567, dated 1943.	$2.50
52-62	Arrangement for the determination of black temperature and color temperature of bodies. Siemens & Halske A. G., Berlin. Ger. patent application S 155573 IXb/42c, dated 1943.	$3.75
63-78	Device for ultrasonic treatment of any material. Siemens-Schuckertwerke A. G., Berlin. Ger. applications for patents of addition S 155131 IXb/42s; S 155137 IXb/42s; S 155136 IXb/42s; dated 1943.	$3.75
79-89	Device for electron-optical detection of solid or liquid substances in gases. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application dated 1943.	$3.75
90-92	Feeding device on automatic scales for slowly flowing substances, especially for flour. Siegburg, M. (Inventor) Ger. patent application S 155193, dated 1943.	$1.50
93-100	Caliper for measuring the wall thickness of rings or tubes. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 155481 IXb/42b, dated 1943.	$2.50
101-104	Taring disc for machines and tools. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 154669, dated 1943.	$1.50
105-112	Process and device for sorting rivets of different length. Siebel-Flugzeugwerke G.m.b.H., Halle/Saale. Ger. patent application S 154654 IXb/42b, dated 1943.	$2.50
113-116	Electric automatic scale with coarse- and fine feeding device. Sievers, M. (Inventor). Ger. patent application S 158012, dated 1943.	$1.50

Frames	Title	Price
117-123	Process for detection of leakage in walls of vessels. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 158023, IXb/42k, dated 1943.	$2.50
124-156	Slide rule. Siemens-Schuckertwerke A. G., Berlin. Ger. patent applications for patents of addition S 154465 IXb/42m; S 154466 IXb/42m; S 154467 IXb/42m; S 154468 IXb/42m; S 154469 IXb/42m; and 154470 IXb/42m; dated 1943.	$6.25
157-161	Control scale for regulation of measuring instruments. Semmler, H. M. (Inventor). Ger. patent application S 157813 IXb/42o, dated 1943.	$1.50
162-180	Process for continuous electric determination of the temporal differential quotient of measuring values. Siemens & Halske A. G., Berlin. Ger. patent application S 154973, dated 1943.	$3.75
181-189	Device for measuring the amount and the distribution of load, especially on vehicles. Ger. patent application W 109564, dated 1941.	$2.50
190-199	Device for mixing liquids. Wagner, J., and Wagner, G. (Inventors). Ger. patent application W 108876 IXb/42e, dated 1941.	$2.50
200-203	Protecting glass for optics. Ger. patent application W 108714 IXa/42h, dated 1943.	$1.50
204-210	Flow meter. Wagner, O. (Inventor). Ger. patent application W 108833 IXb/42e, dated 1941.	$2.50
211-217	Device for comparing the types of "automatically reading calculating machines." Wolf, R. (Inventor). Ger. patent application W 108868 IXb/42b, dated 1941.	$2.50
218-225	Float volumeter. Wagner, O. (Inventor). Ger. patent application W 107472 IXb/42e, dated 1943.	$2.50
226-229	Initial load hardness tester for measuring the depth with automatic adjustment to zero of the dial indicator. Otto Wolpert-Werke, Ludwigshafen/Rhein. Ger. patent application W 107434, dated 1940.	$1.50
230-233	Indicator for float-volumeters. Wagner, O. (Inventor). Ger. patent application W 107823, dated 1940.	$1.50
234-244	Geometric calculating method. Winkel, F. (Inventor). Ger. patent application W 107923 IXb/42m, dated 1940.	$3.75
245-289	Calculating machine with a ten-key-adjusting mechanism. Carl Walther Waffenfabrik, Zella-mehlis. Ger. patent application W 105484 IXb/42m, dated 1940.	$7.50
290-314	Electrical oscillating diaphragm. Wiegelmann, H. (Inventor). Ger. patent application W 108216, dated 1940.	$5.00
315-319	Telemeter on the echo-principle. Ger. patent application L 113345 IXb/42c, dated 1943.	$1.50
320-322	Microscope with illumination by incident light and at least partial erection of the image. Ernst Leitz G.m.b.H., Wetzlar. Ger. patent application dated 1944.	$1.50
323-330	Device for determining the north-south direction or the horizontal or perpendicular direction in vehicles or airplanes. Luftfahrtgerätewerke Hakenfelde G.m.b.H., Berlin. Ger. patent application L 106108, dated 1941.	$2.50
331-338	Levelling tables. Leonhard, E. (Inventor). Ger. patent application L 106133, dated 1941.	$2.50
339-341	Device for adjustment of ground surfaces and the like on microscope tables. Ernst Leitz G.m.b.H., Wetzlar. Ger. patent application L 113435, dated 1944.	$1.50
342-343	Demonstration apparatus for heat expansion. Leimbach, W. (Inventor). Ger. patent application dated 1944.	$1.50
344-349	Device for measuring the consumption of liquid in random-tests. Luftfahrtforschungsanstalt Herman Göring, Braunschweig. Ger. patent application L 113323 IXb/42c, dated 1943.	$2.50
350-355	Surfact tracing instrument with caliper level and tracer. Wallichs, A., and Opitz, H. (Inventors). Ger. patent application W 104197 IXb/42b, dated 1938.	$2.50
356-358	Combined colorimeter and light meter. Lehmann, F. (Inventor). Ger. patent application L 110368, dated 1943.	$1.50

Frames	Title	Price
359-368	Electric tachometer. Allg. Elektrizitäts-Gesellschaft (AEG), Berlin. Ger. patent application L 110396, dated 1945.	$2.50
369-372	Sight glass mounting for electrotechnical apparatus. Ger. patent application L 110142, dated 1943.	$1.50
373-376	Instrument for measuring length. Loosen, P. H. (Inventor). Ger. patent application L 111372, dated 1943.	$1.50
377-381	Device for carrying out physiochemical measurements. F. & M. Lautehschläger G.m.b.H., Berlin. Ger. patent application L 109954, dated 1942.	$1.50
382-384	Relay connection for electric sorting devices. Ger. patent application L 109919, dated 1942.	$1.50
385-394	Electric calculating apparatus. Ger. patent application L 109786 IXb/42m, dated 1942.	$2.50
395-399	Projectile velocity testing screen. Fa. E. Leybold's Nachf, Cologne. Ger. patent application L 112206, dated 1943.	$1.50
400-403	Cylindrical scale. C. Lorenz A. G., Berlin. Ger. patent application L 113322, dated 1943.	$1.50
404-415	Drawing tool for dividing machines, especially for scale dividing machines. Lipp, R. W., Berlin. Ger. patent application L 101655, dated 1940.	$3.75
416-422	Device used as an oil brake for measuring periodically occuring impact-like pressures. Allg. Elektrizitäts-Gesellschaft (AEG), Berlin. Ger. patent application L 101705 IXb/42k, dated 1940.	$2.50
423-431	Ray disperser made of cemented prisms. E. Leitz, Wetzlar. Ger. patent application L 101720 IXa/42h, dated 1942.	$2.50
432-435	Photoelectric measuring-recording- and controlling-device for determining the rotation of the plane of polarization. Ger. patent application L 101468, dated 1940.	$1.50
436-440	Method and device for recognizing moving objects. Kepka, A. (Inventor). Ger. patent application K 169595, dated 1943.	$1.50
441-442	Joint part for flexible connections, especially on precision measuring instruments. Kroneis A. (Inventor). Ger. patent application K 169632 IXb/42d, dated 1943.	$1.50
443-453	Level gage for fuel tanks. Kraus, O. (Inventor). Ger. patent application K 169921 IXb/42e, dated 1943.	$3.75
454-456	Tensile stress meter for armor steel. Koening, H. (Inventor). Ger. patent application K 169788, dated 1943.	$1.50
457-461	Plug gage. Klöckner-Humboldt-Deutz A. G., Cologne. Ger. patent application dated 1943.	$1.50
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472-477	Process and device for hardness testing. Kohle- und Eisenforschungs- G.m.b.H., Dortmund. Ger. patent application K 162824 IXb/42k, dated 1941.	$2.50
478-485	Position finding for aircraft. Kleinwächter, H. (Inventor). Ger. patent application K 162793 IXb/42c, dated 1941.	$2.50
486-491	New bimetal. (Thermo-bimetal). Fr. Krupp A. G., Essen. Ger. patent application K 162789 IXb/421, 1941.	$2.50
492-494	Dynamic-elastic gravity determination. Ger. patent application K 162741 IXb/42c, dated 1941.	$1.50
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509-515	Measuring instrument with linear indication. Kramolin, L. von (Inventor). Ger. patent application K 162167, dated 1941.	$2.50
516-521	Automatic projector for slides. Ger. patent application K 162073, dated 1941.	$2.50

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522-530	Production of vibrations with spherical bodies. Kürth, R. (Inventor). Ger. patent application K 158665, dated 1940.	$2.50
531-535	Marking for optical observation devices. Zeiss Ikon A. G., Dresden. Ger. patent application Z 28509 or 28309, dated 1943.	$1.50
536-537	Production of thermometer capillaries from plastics. Zuckschwerdt, F. and Brandenburger, K. (Inventor). Ger. patent application 728469 IXb/42i, dated 1944.	$1.50
538-541	Device for adjusting the mirror of a mirror-oscillograph in relation to the optical axis. Zeiss Ikon A. G., Dresden. Ger. patent application dated 1943.	$1.50
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550-568	Apparatus for measuring seams of angularly welded parts. Waggonfabrik Uerdingen A.G., Ger. patent application W 107280, dated 1940.	$3.75
569-578	Device for measuring high gas pressures. Ger. patent application W 107679 IXb/42k, dated 1940.	$2.50
579-586	Compass provided with arc graduation for circle, ellipse and spiral. Weber, W. (Inventor). Ger. patent application W 109233, dated 1941.	$2.50
587-605	Projection indicating apparatus for aircraft. Winckel, F. (Inventor). Ger. patent application W 106808, dated 1940	$3.75
606-613	Flow and mixing regulator. Wagner, C. (Inventor). Ger. patent application W 107809, dated 1940.	$2.50
614-621	Gas-meter with two measuring chambers. Ger. patent application W 107734, n.d.	$2.50
622-631	Pressure recorder. Ger. patent application W 107677, dated 1940.	$2.50
632-639	Indicating instrument with casing angularly adjustable or in stationary arrangement in relation to the feeler-axis. Werner, A. (Inventor). Ger. patent application W 107665, dated 1940.	$2.50
640-641A	Time recorder. Fa. Was War Wann Apparate Brunh, Berlin. Ger. patent application W 107397, dated 1940.	$1.50
642	Adjustable standard-limit gage bolt. Wicht, W. (Inventor). Ger. patent application W 107295, dated 1940.	$1.50
643-644	Protective glass cover for optical systems. Winandy, R. K. (Inventor). Ger. patent application W 108993, dated 1941.	$1.50
645-650	Hardness tester with printing device for the hardness numbers. Otto Wolpert Werke, Ludwigshafen/Rhein. Ger. patent application W 108103 IXb/42k, dated 1940.	$2.50
651-663	Device and process for measuring, registering and controlling mechanical oscillations of any kind. Wittmer, A. (Inventor). Ger. patent application W 108600, dated 1941.	$3.75
664-668A	Apparatus for measuring the differences in black intensities. Zeiss Ikon A. G., Dresden. Ger. patent application Z 28472 IXa/42h, dated 1944.	$2.50
669-678	Arrangement for storing stereoscopic pictures. Zeiss Ikon A. G., Dresden. Ger. patent application Z 28467, dated 1944.	$2.50

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679-687	Apparatus for reading microfilms. Zwiauer, A. (Inventor). Ger. patent application Z 28834 IXa/42h, dated 1944.	$2.50
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699-703	Arrangement for directing the water in brake power meters. Fr. Krupp Germaniawerft A.G., Kiel. Ger. patent application K 158557, dated 1940.	$1.50
704-711	Rapid measuring and registering device for surveying. Ger. patent application K 162010 IXb/42c, dated 1941.	$2.50
712-715	Measuring the velocity of detonation. Fr. Krupp A. G., Essen. Ger. patent application K 162048, IXb/42o, dated 1941.	$1.50
716-720	Device for measuring the quantity of air in a liquid storage tank. Heimberger, H. (Inventor). Ger. patent application H 166962 / 421, dated 1941.	$1.50
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728-736	Portable optical recorder. Hartmann & Braun A. G., Frankfurt/Main. Ger. patent application H 171738, dated 1943.	$2.50
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741-744	Transmission lever for balances. Fa. Heinr. Heine, Essen. Ger. patent application H 171657, dated 1943.	$1.50
745-748	Permanent wall calendar. Hartmann, A. (Inventor). Ger. patent application dated 1943.	$1.50
749-753	Device for measuring the contents of a tank. Herbrechtsmeier, H. (Inventor). Ger. patent application H 170069 IXb/42e, dated 1942.	$1.50
754-755	Sighting device for prismatic compass. Heidner, A. (Inventor). Ger. patent application H 170054, IXb/42c, dated 1942.	$1.50
756-760	Flow meter. Fr. Hecht, Berlin. Ger. patent application H 166126 IXb/42n, dated 1941.	$1.50
761-765	Apparatus for emptying the watermeter. Hahn, J. (Inventor). Ger. patent application H 170400, dated 1942.	$1.50
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771-774	Radial sextant. Jacke (Inventor). Ger. patent application H 171640 IXb/42c, dated 1943.	$1.50
775-777	Oval wheel meter with electric remote control indication of consumption at any given moment. Harn, O. (Inventor). Ger. patent application H 168532, dated 1942.	$1.50

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778-784	Altimeter and marking apparatus. Klatt, W. (Inventor). Ger. patent application K 162085, dated 1941.	$2.50
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792-796	Measuring connection for opaqueness photometers. Klangfilm G.m.b.H., Berlin. Ger. patent application K 162678 IXa/42h, dated 1941.	$1.50
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806-811	Speed regulator for flowing driving agents. Henschel Flugzeug Werke A. G., Schönefeld. Ger. patent application dated 1941.	$2.50
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820-869	Method for surveying wooded areas. Hohenadl, W. (Inventor). Ger. patent application H 166141, dated 1941.	$7.50
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880-887	Method and device for establishan artificial horizon. Heinrich, G. (Inventor). Ger. patent application H 166769 IXb/42c, dated 1941.	$2.50
888-896	Periscope for observing the air space. Ger. patent application H 164505, dated 1941.	$2.50
897-901	Piezoelectric pick-up. Hagenuk G.m.b.H., Kiel. Ger. patent application H 164471 IXa/42g, dated 1942.	$1.50
902-909	Fever thermometer with scale within the glass. Härtel, E. (Inventor). Ger. patent application H 168484 IXb/42i, dated 1942.	$2.50
910-915A	Optical system for illumination of cross-shaped marks. Hanisch, K. (Inventor). Ger. patent application dated 1942.	$2.50
916-918	Apparatus for testing the acid contents of milk with liquid color reagents. Hackmann, C. (Inventor). Ger. patent application H 167266 IXb/24 l, dated 1942.	$1.50
919-922	Rapid-drawing and measuring angle. Hagu, E. (Inventor). Ger. patent application H 172284, dated 1943.	$1.50
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928-934	Process and device for sorting rivets. Ernst Heinkel Flugzeugwerke A. G., Vienna. Ger. patent application H 170255, dated 1942.	$2.50
935-939	Measuring arrangement for automatic colorimetric determination of concentration with photocells. Siemens & Halske, Berlin. Ger. patent application S 154976, dated 1942.	$1.50
940-948	Process for determining variations of light intensity, especially for colorimetric and radiation-pyrometry measurements. Siemens & Halske, Berlin. Ger. patent application dated 1943.	$2.50
949-957	Ultrasonic treatment of any material. Siemens-Schuckertwerke A. G., Berlin. Ger. patent application S 155135 IXb/42s, dated 1943.	$2.50

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